

The impact of competition interventions on compliance and deterrence

Final Report

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1 EXECUTIVE SUMMARY

- 1.1 The Office of Fair Trading (OFT) commissioned London Economics to undertake a study analysing competition compliance and deterrence resulting from the UK competition regime.
- 1.2 A large body of academic literature has analysed competition deterrence associated with different types of enforcement instruments (for example, fines, imprisonment, leniency programmes), especially in the context of cartel agreements. However, relatively few studies have attempted to quantify the overall deterrent effect of the competition regime as a whole and analysed the role of specific interventions. Deloitte (2007) is a notable exception and the present study updates and extends the analysis in Deloitte (2007) along several dimensions.
- 1.3 The present study:
- contributes to research on the impact of competition interventions on compliance and deterrence in the UK and more widely
 - identifies and attempts to quantify the wider benefits and costs associated with deterrence resulting from enforcement activities undertaken by the OFT
 - analyses how the impact on deterrence and compliance varies by business size, sector and broad type of anti-competitive conduct (mergers, abuses, cartels and other anti-competitive agreements)
 - contributes to gaining a better understanding of firm behaviour and how this impacts compliance, and
 - seeks firms' views on the effectiveness of UK competition enforcement at ensuring deterrence.
- 1.4 This study therefore has a wider scope than Deloitte (2007). It differs from the Deloitte study in the following main ways:

- The analysis of results is based on a survey of a larger sample of businesses. Deloitte (2007) was based on a sample of 202 UK companies with 200 or more employees (large firms). In contrast, this study includes 501 responses from large firms and 308 responses from small firms.¹
- The study also covers a wider range of issues. The additional issues covered in this study are:
 - Knowledge and awareness of:
 - the basic concepts of competition law
 - specific aspects of the competition regime
 - OFT guidance and tools, and
 - individual competition law investigations by case name.
 - The deterrent effect of sanctions and specific enforcement interventions:
 - a wide range of specific sanctions and tools including Director Disqualification Orders and Leniency Policy and informant rewards, and
 - the deterrent impact of individual competition law investigations by case name.
 - Behavioural testing of the impact of sanctions and social preferences using an economic experiment.

¹ For the purposes of this study, 'large firms' are defined as those with 200 or more employees and small firms are defined as those with fewer than 200 employees. It is important to note that this study oversampled large businesses to allow comparison of the results with the Deloitte study. This means that the results for small businesses are subject to greater sampling uncertainty and should be interpreted with a greater degree of caution than the results for large businesses.

1.5 The study combines a number of different sources of information. First, a review of previous studies in the area was undertaken. Secondly, information was collected through:

- A business survey investigating company perceptions of the drivers of compliance, awareness, deterrence effects and the effectiveness of the UK competition regime. A total of 809 completed responses from businesses were obtained.
- A behavioural experiment with firm representatives testing drivers of compliance and the effectiveness of different approaches to securing compliance. A total of 93 business representatives completed the behavioural experiment.
- Consultations of professionals from legal firms (the legal survey) examining similar issues as the business survey but from the point of view of competition lawyers. A total of 27 telephone interviews were completed.
- Consultations with business stakeholders structured as open discussions. A total of nine stakeholder organisations were approached, seven declined and two participated.

1.6 The primary focus of the report is on the results of the business survey.

Deterrence ratios

1.7 In line with previous research, we find non-negligible wider benefits of the OFT's competition enforcement work. The estimated deterrence ratios indicate the number of cases deterred due to the risk of OFT intervention for every case undertaken by the OFT. The deterrence ratios are reported for large firms only.²

² Due to the smaller sample of small businesses, the small business deterrence ratios are more uncertain and, in general, are not statistically different from zero.

Table 1.1: Deterrence ratios 2003-11: Number of cases deterred for every OFT investigation

	Deterrence ratio
Cartel	28
Other commercial agreements	40
Abuse	12

Note: 95 per cent confidence intervals: Cartel 16-41, Other commercial agreements 21-58, Abuse 4 - 20. See Annex F for detailed calculations. The figures refer to deterrence ratios for 'large' firms (200+ employees) only.

1.8 The deterrence ratios obtained in this study are significantly higher than those obtained from the business survey in Deloitte (2007).³ However, they are not directly comparable as there are a number of methodological differences. In particular, the Deloitte report included the effect of deterring companies of above 500 employees only. The sample used by Deloitte for the deterrence ratios was therefore 167 businesses in total. The deterrence ratios reported here are based on a larger sample of businesses (501) and includes business with 200 - 499 employees. This study, therefore, captures deterred activities from a wider range of firms by employee size. In addition, the deterrence ratios cover two different periods in time. We would therefore caution against directly comparing the results of the two studies, and for similar reasons, we would not recommend using the deterrence ratios presented above as estimates of likely deterrent effects in other jurisdictions.

1.9 Due to the small number of qualifying mergers (33) reported by large firms in the survey sample, we do not believe that it is appropriate to present deterrence ratios for merger investigations. However, in line with Deloitte (2007), we do report the percentage of qualifying mergers that

³ Deloitte (2007) also estimated deterrence ratios based on the results of a survey of professionals from legal firms.

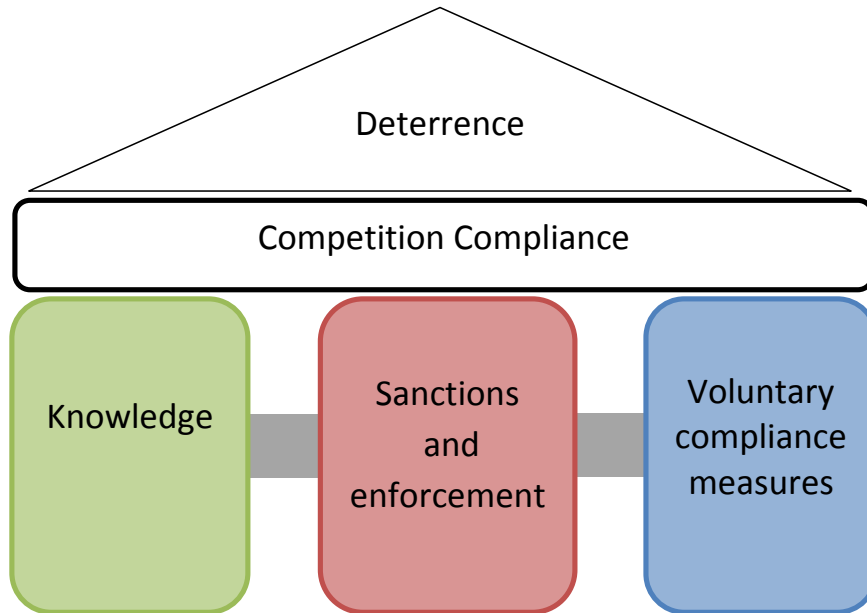
were modified or abandoned. The survey found that six mergers (18 per cent) were abandoned and five mergers (15 per cent) were modified on competition grounds before the OFT became aware of them. Six mergers (18 per cent) resulted in a finding of Substantial Lessening of Competition (SLC) or Undertaking in Lieu of Reference (UiL). These percentages are higher than those found by the previous study from Deloitte (2007).

Three pillars of compliance

- 1.10 This study identifies three key pillars of compliance: knowledge and awareness of competition law, sanctions and enforcement, and voluntary compliance measures. These three pillars of competition compliance are closely interlinked and support each other. The OFT study 'Drivers of compliance and non-compliance with competition law' (2010), highlights the importance of these three pillars.
- 1.11 Knowledge and awareness are important in helping businesses identify the key compliance risks they face, how to assess these risks and how to mitigate any risks so that breaches of competition law are avoided in the first place. Businesses' awareness of specific interventions is also important for how business identify risk areas.
- 1.12 Sanctions and enforcement are important drivers of compliance with competition law as they encourage businesses to focus on competition law compliance, and can aide in ensuring commitment to compliance by senior management. Stronger sanctions increase the cost to a business if non-compliance is found, while more enforcement increases the probability that that non-compliant behaviour is detected and penalised.
- 1.13 Voluntary compliance measures include how competition compliance fits into the broader compliance agenda within the business, internal practices used by business to ensure that employees are confident and informed about competition law compliance, and the sources of information and advice business use to ensure compliance.

1.14 The OFT may therefore support competition compliance and improve deterrence through all three pillars. For example, by providing guidance and information on compliance measures and risks, by ensuring the penalties regime is designed to achieve optimal deterrence,⁴ and encouraging and facilitating a culture of compliance within firms.

Figure 1.1: Pillars of competition compliance and deterrence



Source: London Economics

Knowledge of competition law

1.15 The results of the business survey shows that small and large businesses agree that the most important driver of non-compliance with competition law is lack of knowledge about the law. Seventy-three per cent and 85 per cent of small and large companies respectively, noted that lack of knowledge about the law was very or quite likely to increase risk of non-compliance. However, our analysis clearly shows that knowledge and awareness of competition law and specific competition interventions is

⁴ OFT 2009.

limited. Forty-eight per cent of **all** businesses reported that they were fairly or very knowledgeable about competition law as whole. However, only 35 per cent of small businesses reported that they feel very or fairly knowledgeable. This compares to 57 per cent of respondents from large businesses. This may reduce the potential for specific sanctions and enforcement interventions to achieve wider compliance and deterrence as businesses (particularly small business) are not aware of specific aspects of competition law and intervention cases, therefore do not take account of them in their internal compliance activities.

Sanctions and enforcement

- 1.16 The survey evidence also shows that high profile OFT enforcement cases result in greater behavioural change than lesser known cases.⁵ Specifically, the replica football kit cartel case led to more cases of behavioural change than any other intervention covered in the survey. For investigations into other anti-competitive agreements the centralised credit card hire fees case involving the Association of British Insurers and the case of price coordination in the UK Grocery sector had the greatest behavioural impact reported by businesses. In the case of abuse of dominance cases, the Gaviscon case was reported as having a behavioural impact on a firm within the pharmaceuticals sector. However, caution should be exercised in interpreting the results as very few businesses reported behavioural change due to specific cases overall.
- 1.17 Due to the low incidence of behavioural change reported in response to specific cases in the business survey we cannot directly assess whether behavioural change is greater in sectors directly affected by a specific intervention than in other sectors.
- 1.18 However, legal professionals reported that the effect of specific interventions is greater in the sector specifically affected by the investigation than sectors that were not affected. In support of this,

⁵ 'High profile' cases are considered as cases with high levels of awareness amongst businesses.

there is indirect evidence that enforcement actions may have positive spill-over effects in terms of improved knowledge about competition issues and wider use of voluntary compliance measures in companies operating in sectors affected by OFT competition investigations. We find that businesses in sectors with one or more competition interventions since 2003 are significantly more knowledgeable about various aspects of the UK competition regime and these companies also are more likely to use voluntary compliance measures.

- 1.19 There is also clear evidence that businesses perceive OFT enforcement tools and sanctions as important drivers of compliance. Most important are fines to the company, reputational damage to the company and criminal sanctions. In previous work, the OFT also found that financial penalties and reputational damage to the firm were important.⁶ The Deloitte 2007 study that found the most important sanctions that motivated compliance were individual sanctions such as criminal penalties and disqualification of directors.⁷
- 1.20 Importantly, businesses report that reputational damage arises both from an OFT decision and from an OFT investigation. So, competition authorities should be mindful that even investigations leading to a non-infringement decision may have a deterrent effect.
- 1.21 It appears from businesses that relatively new and lesser known enforcement tools such as leniency programmes and early resolution have some deterrent effect. This is lower than for other forms of interventions, which, to some degree, may reflect low awareness of these tools by businesses.

⁶ OFT 2010c, Drivers of compliance and non-compliance with Competition Law.

⁷ OFT 2010c also found that a number of firms mentioned the importance of individual sanctions, such as the risk of criminal proceedings, director disqualification, personal reputational damage or internal disciplinary sanctions, in encouraging individuals to focus on competition law compliance.

- 1.22 Legal experts report however, that leniency policy is an important deterrent tool.
- 1.23 A novel behavioural experiment involving business representatives also shows that anti-competitive behaviour responds to financial incentives. Experiment participants were less likely to choose a risky alternative (the cartel option) if there was a high probability of detection, a high sanction or a low gain from a risky option.
- 1.24 However, the experiment also illustrates that the choice of whether or not to participate in a cartel depends not only on financial incentives but also on the degree of risk aversion and social preferences to minimise costs to other people in the economy. The biggest challenge for competition authorities is therefore to deter the group of people who display risk-loving behaviour, that is, always choose the cartel option because it involves the possibility of a high gain.
- 1.25 The behavioural experiment also reveals that knowledge about competition law may not only be associated with greater compliance but may also be a sign of potential non-compliance, as respondents that reported being more knowledgeable about competition law were more likely to choose the riskier (cartel) option in the experiment, and required a lower possible pay-off for taking the risk.

Voluntary compliance measures

- 1.26 Although most large companies already use some voluntary compliance measures, there may be scope to formalise competition compliance further, especially in small businesses. It should be noted, however, that highly formalised and involved compliance measures may not be desirable in all companies because of the risk of excessive compliance costs for companies. This may explain why small companies are less likely to use compliance processes and instead may deal with compliance issues on a more ad-hoc basis.

- 1.27 However, when compliance processes are not formalised, one would expect the risks associated with lack of knowledge of competition law and competition issues to be greater.
- 1.28 The most common compliance measure taken by businesses is to seek external advice. Therefore, it is important that advice provided by legal advisers is well informed and accurate. OFT guidance and decisions appear to be useful for legal professionals in this respect.
- 1.29 The OFT's 'Drivers of compliance and non-compliance' report suggests a four step approach to effective competition law compliance culture (2010c), with risk assessments being one of the key steps to ensuring a commitment to compliance. Our survey of businesses indicates that the second most common compliance measure, after seeking external advice on competition law matters, is to carry out competition risk assessments.

Overall effectiveness of the UK competition regime

- 1.30 Most businesses perceive the UK competition regime as fairly effective. This is also the case when considering the effectiveness with respect to deterring different types of anti-competitive behaviour.
- 1.31 However, legal professionals indicate that there is room for improvement in some areas of the UK competition regime. In particular, legal professionals suggest that:
- the probability of detection is relatively low in competition cases
 - there are some cases of type II enforcement errors, that is, case where anti-competitive behaviour is wrongly cleared
 - there are some type I enforcement errors in competition cases, that is, competitive conduct sometimes is not cleared although it should have been.
- 1.32 However, overall, the OFT's ability to deter potentially anticompetitive conduct is rated relatively favourable.

1.33 The OFT's effectiveness in merger cases is generally rated more favourably by legal professionals than the effectiveness in competition law cases.

Policy observations

1.34 Overall, our analysis suggests that there are important wider benefits associated with OFT enforcement activities.

1.35 Sanctions and enforcement in the UK appear to have a substantial deterrent effect. The deterrence ratios indicate that for every cartel investigation, 28 cartel cases are deterred. In the case of other commercial agreements and abuse of dominance for every OFT investigation, 40 and 12 cases are deterred respectively.

1.36 Businesses' confidence in their knowledge about competition law appears to be weak, particularly among smaller firms.

1.37 There is scope for improving awareness and knowledge. Initiatives aimed at improving knowledge could be focused on:

- Making more businesses aware of basic concepts of competition law.
- Improving the **quality** of the information provided by the OFT to businesses. For example, business stakeholders suggested that guidance could be improved by making use of more examples, and, where feasible, shortening guidance.

1.38 Voluntary competition compliance could be strengthened as overall 58 per cent of small companies surveyed and 37 per cent of large companies have no compliance measures in place.

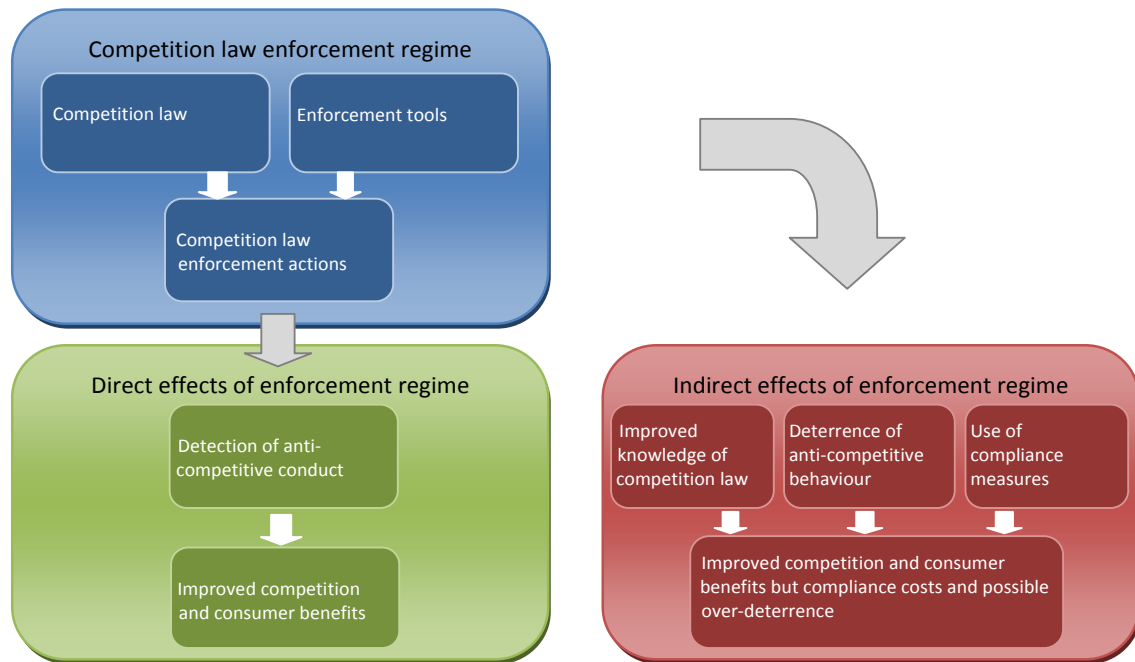
1.39 The OFT can also play a role in supporting and informing voluntary competition compliance either directly through the OFT website or indirectly through the general press and trade journals. Small businesses may be better reached through the general press or trade journals.

1.40 When asked how the OFT could most improve effectiveness of its competition role, the majority of business respondents suggested that effectiveness would be improved if the OFT undertook fewer but more high profile cases, while legal professionals suggested that undertaking more cases overall would improve effectiveness. It is important of course to note that it is difficult to identify ex ante what cases will be a 'high profile'. Further, 'high profile' was not defined in the survey and therefore the definition of a high profile case is subjective. There are, however, similarities in the reported awareness of cases and cases that have resulted in a change in business behaviour. For example, reported awareness was high for the price fixing replica football cartel case and this case was also reported to have changed business behaviour. Similarly, awareness of price co-ordination involving the UK Grocery sector had a high awareness rating and led to behavioural change.

2 INTRODUCTION

- 2.1 A country's competition regime consists of the following three elements: the competition laws; the enforcement instruments available; and, the enforcement activities undertaken by public authorities within the framework provided by the competition law (the blue box in Figure 2.1).
- 2.2 Enforcement activities undertaken by the OFT and other authorities result directly in the detection and punishment of anti-competitive behaviour. This in turn improves competition in the marketplace and yields benefits to consumers because anti-competitive behaviour is stopped and potentially anti-competitive mergers are abandoned or modified (the green box in Figure 2.1).
- 2.3 However, there may also be substantial indirect benefits associated with competition law enforcement (the red box in Figure 2.1). The threat of enforcement action and associated sanctions increase the expected cost of anti-competitive behaviour to businesses and individuals, making anti-competitive behaviour less attractive.
- 2.4 This may encourage businesses more widely to comply with competition law and set up formal or informal procedures to ensure compliance and minimise the risk of being subjected to a competition investigation.
- 2.5 Competition enforcement actions often receive media attention and may therefore also improve awareness of competition issues and competition law. This may also encourage compliance with competition law.

Figure 2.1: Possible effects of competition law enforcement



Source: London Economics

- 2.6 Any deterred anti-competitive behaviour will result in fiercer competition and yield substantial benefits to consumers.
- 2.7 However, businesses also face compliance costs and, in some circumstances, the enforcement regime may have unanticipated negative effects if businesses are too worried about the risk of being subjected to a competition investigation. In such circumstances businesses may devote too many resources to compliance activities – resources that could otherwise have been used more productively. Businesses may also be overly cautious about engaging in activity which they fear could be viewed as anti-competitive even if, in fact, it is not.

Purpose of study

- 2.8 This study aims to contribute to research on the impact of competition interventions on compliance and deterrence in the UK and more widely.

2.9 In particular, the study identifies and attempts to quantify the wider benefits and costs associated with deterrence resulting from enforcement activities undertaken by the OFT. In doing so, the study focuses on general rather than specific deterrence, that is,, deterrence resulting from competition enforcement activities above and beyond the specific deterrent effect on businesses affected by a given enforcement action.⁸

2.10 This research builds on an OFT study undertaken by Deloitte in 2007 which estimated the deterrent effect of OFT competition enforcement over the period from 2000 to 2007.⁹ The current study expands the analysis in Deloitte (2007) by:

- analysing how the impact on deterrence and compliance of the OFT's work varies by business size, sector and broad type of anti-competitive conduct (mergers, cartels, abuses, etc.)
- gaining a better understanding of firm behaviour and how this impacts on compliance
- seeking firms' views (especially those of SMEs) on UK competition enforcement
- reviewing developments since 2007 (for example,, the impact of recent interventions, the operation of the leniency policy and the development of settlement policy), and
- providing insights into a number of policy questions such as the impact of leniency programmes and settlement policy.

⁸ A definition of general and specific deterrence is provided in Annex A.

⁹ OFT962, 'The deterrent effect of competition enforcement by the OFT'. The report was prepared by Deloitte & Touche for the OFT. The report is available from the OFT website: www.of.gov.uk/OFTwork/consultations/closed/2008/deterrent.

- 2.11 In order to achieve these objectives, the study uses a larger sample of businesses than in Deloitte (2007) and, in contrast to Deloitte (2007), the sample of businesses also includes small- and medium-sized enterprises (SMEs). The study also covers a number of different topics including awareness of a wide range of competition issues and deterrence effects of individual competition law investigations. However, compared to Deloitte (2007) less emphasis is given to the views of legal professionals and the magnitude of deterrence is not estimated based on the legal survey.
- 2.12 A novel feature of the current study is the behavioural experiment which is used to observe how business representatives respond to sanctions and whether social preferences impact on decision taken by business regarding their compliance with competition laws.

Scope of study

Types of potentially anti-competitive conduct considered

- 2.13 The competition regime in the United Kingdom is built upon the Competition Act 1998 ('Competition Act') which prohibits anti-competitive agreements and abuses of dominance.
- 2.14 Together with the Enterprise Act 2002 ('Enterprise Act'), the Competition Act lays the statutory foundation for the antitrust prohibition and merger control in the United Kingdom.
- 2.15 This study considers the following types of **potentially** anti-competitive conduct:
- mergers
 - abuse of dominance
 - cartel agreements, and
 - other commercial agreements.

- 2.16 Cartel agreements and other anti-competitive agreements between undertakings are prohibited under Section 2 of the Competition Act. In addition, section 188 of the Enterprise Act prohibits individuals from engaging in cartel activity.
- 2.17 The Competition Act also prohibits abuses of a dominant position and the Enterprise Act specifies that the Competition Commission, upon reference from the OFT, may prohibit a merger or impose remedies if the merger has caused, or may be expected to cause, a substantial lessening of competition. However, it should be emphasised that mergers are not necessarily anti-competitive and that mergers may result in efficiency gains that can benefit consumers (Schinkel and Tunistra, 2006, and Bork, 1978).

Types of competition interventions considered

- 2.18 The set of competition interventions considered by the present study includes OFT investigations:
- not leading to a decision on infringement or non-infringement
 - leading to a decision on infringement or non-infringement but no appeal
 - leading to a decision on infringement or non-infringement and an appeal resulting in the OFT decision being upheld, and
 - leading to a decision on infringement or non-infringement and an appeal resulting in the OFT decision being overruled.

Competition interventions not considered by the study

- 2.19 The Competition Act is, as a general rule, enforced by the Office of Fair Trading (OFT) but a number of sectoral regulators also have jurisdiction to investigate anti-competitive conduct in their specific sectors.

2.20 The study focuses on effects attributable to the OFT and therefore does not cover interventions carried out by the sectoral regulators in the following industries:

- Gas and electricity
- Water
- Telecommunications
- Rail

2.21 We note that, in other sectors, investigations and prosecutions under the Enterprise Act are conducted by the OFT and, in the case of merger control, the OFT must either refer mergers expected to substantially lessen competition to the Competition Commission (CC) or, if appropriate, seek undertakings in lieu of a reference from the merging parties. If a merger is referred to the CC, the latter will conduct a full investigation and, if the merger has caused or may be expected to cause a substantial lessening of competition, the CC will either prohibit the merger or impose remedies.

2.22 In the survey design, we try to separate the deterrent effects of the phase 1 merger investigations undertaken by the OFT and the phase 2 merger investigations undertaken by the CC.

Methodology

2.23 The study combines a number of different sources of information. First, a review of previous studies in the area was undertaken. Second, new primary information was collected through:

- **A business survey:** The survey gathered company perspectives on the effectiveness of enforcement activities, their awareness of activities and enforcement instruments, the relative effectiveness of different approaches, the drivers of compliance, the compliance procedures they have put in place, etc. In addition, respondents were

asked to report behavioural impacts of a number of interventions. A total of 809 completed responses from businesses were obtained.

- **A behavioural experiment with firm representatives.** An online experiment was used to examine drivers of non-compliance and the effectiveness of different approaches to securing compliance. The objective of the experiment was to explore the deterrence effects on compliance officers' behaviour when they are faced with (i) different fine levels (including doubling the fine level), (ii) different probabilities of detection/incurring a fine and the effect on their behaviour when their decision can create third-party (consumer) harm. A total of 93 business representatives participated in the behavioural experiment.
- **Consultations with business stakeholder organisations.** These consultations examined similar issues as the business survey but involved a smaller number of stakeholders and were structured as open discussions. The consultations with business stakeholders were also used to inform the questionnaire design. A total of 9 stakeholders organisations were approached, 7 declined and 2 participated.
- **A survey of legal professionals.** This legal survey examined similar issues as the business survey but from the point of competition lawyers. A total of 27 telephone interviews were completed.

2.24 The primary focus of the report is on the results of the business survey and the experiment. These findings are complemented by information obtained from the consultations with business stakeholders and survey responses from competition lawyers.

Sampling

2.25 The selected sampling frame for the business survey was designed to ensure the highest possible level of comparability between the current study and Deloitte (2007). Deloitte (2007) only surveyed companies with 200 employees or more. Therefore, for the purpose of this report, large companies were defined as companies with 200 employees or

more. Small companies are defined as companies with less than 200 employees. Thus, only the results for large companies are comparable to the results obtained by Deloitte (2007) while the results for small companies are not. It is also worth noting that the selected sampling frame ensured a larger number of responses from large companies than that obtained by Deloitte (2007). As a result, the sampling uncertainty of the results for large companies is reduced in the present study.

- 2.26 The selected sampling frame for the business survey also included a large number of small businesses. However, it should be noted that large businesses are significantly oversampled in the survey in order to allow for a comparison with Deloitte (2007). Therefore, the results for small businesses are subject to greater sampling uncertainty and should be interpreted with a greater degree of caution than the results for large businesses. Overall, the survey results, nevertheless, give an indication of the views and behaviour of small businesses in the UK.
- 2.27 The completed sample included 501 responses from large companies and 308 responses from small companies. Throughout the report results are presented separately for small and large businesses. Results are not provided for the population of UK businesses overall.
- 2.28 In addition to business size, the sampling frame also aimed at allowing comparisons between businesses affected by different types of competition law investigations (defined as abuse of dominance, cartels and other potentially anti-competitive agreements). Survey participants were split evenly between sectors with and without competition law interventions.
- 2.29 For legal reasons, certain sectors with ongoing investigations or appeals were excluded from the study. Businesses from these sectors have not been included in the sample nor did we directly ask questions about interventions in these sectors in the survey. The excluded sectors for legal reasons are construction; retail sale in non-specialised stores; manufacture of dairy products; activities auxiliary to financial services, except insurance and pension funding; employment activities; and passenger air transport.

- 2.30 Similarly, some UK law firms were not contacted as part of the legal survey because they are involved in ongoing competition investigations or appeals.
- 2.31 The online experiment was conducted with a sample of competition compliance officers that completed the business survey and agreed to participate in a six minute follow-up experiment.

Outline of study

- 2.32 The study is structured as follows:
- Chapter 3 reviews existing literature in the area of competition deterrence and compliance.
 - Chapter 4 analyses drivers of non-compliance based on evidence collected for this study. Building on the analysis, and drawing from previous OFT studies, a typology for understanding compliance is developed. The typology defines three pillars of competition compliance: knowledge and awareness, sanctions and enforcement, and voluntary compliance measures. Each of these pillars are analysed in detail in the subsequent chapters.
 - Chapter 5 analyses business knowledge and awareness of concepts of UK competition law and specific investigations undertaken by the OFT.
 - Chapter 6 analyses deterrence arising from sanctions and enforcement action undertaken by the OFT. The analysis draws on both reported perceptions and behavioural effects from the business survey, and a behavioural experiment analysing responses of participants in the experiment to different sanctions.
 - Chapter 7 considers competition compliance processes and measures used by companies, advice provided to businesses by legal professionals, and the OFT's role in informing both compliance processes and measures and advice provided by legal professionals.

- Chapter 8 analyses the overall deterrent effect of the UK competition regime by calculating deterrence ratios for different types of competition interventions. Potential over-deterrence is also considered.
- Chapter 9 analyses the perceptions of both businesses and legal professionals of the effectiveness of the UK competition regime, and discusses improvements suggested by these stakeholders.
- Chapter 10 presents the conclusions and policy observations from the study.

2.33 Supporting material is provided in the annexes, and the detailed tabulations of the responses to the legal survey and the business survey and a detailed description and analysis of the behavioural experiment are provided in a stand-alone annex.

3 REVIEW OF EXISTING STUDIES

- 3.1 There exists a large body of literature analysing the effects of competition enforcement and this study contributes further to this literature. This chapter provides a review of existing literature and thus places the present study into the wider research context.
- 3.2 The chapter is structured as follows. First, we consider studies analysing the overall deterrence effect of competition regimes. Secondly, we discuss possible unintended consequences of competition enforcement. We then discuss studies of tools available for achieving deterrence and the associated deterrence effect. Finally, we review evidence on compliance measures used by businesses.

The overall deterrent effect of competition regimes

- 3.3 Hylton and Deng (2007), examining how different antitrust penalty systems affect the level of competition in individual countries, find that the scope of a country's competition law is positively associated with a measure of the intensity of competition in the country's economy. In addition, they find that increasing the range of instruments available to enforcement authorities has a significant impact on competition intensity.
- 3.4 In the UK, the Deloitte report for the OFT (2007) analysed the magnitude of the deterrence effect arising from competition enforcement, drawing on in-depth interviews with practitioners and companies, a legal survey and a business survey (of companies with more than 200 employees). The report concluded that the OFT's merger control and competition law enforcement work plays an important role in deterring other anti-competitive behaviour from taking place. Similarly, Davies and Majumdar (2002) concluded that with regards to the UK, 'survey evidence (and casual empiricism) suggests that a wider, more general, deterrence is important' (p.7).
- 3.5 Taken together, the research findings suggest that the benefits of OFT investigations might be significantly higher than the direct financial

benefits resulting from the OFT's merger and infringement decisions. While difficult to quantify, wider impacts of OFT work such as deterrence effects should not be ignored. Davies (2010) recommended that deterrence be given more prominence by presenting a range of estimates (rather than just point estimates). Consequently, the OFT's report 'Positive Impact 09-10: Consumer benefits from the OFT's work (OFT 2010) presented a range of indicative estimates where the upper bound included a 'deterrence' multiplier.

- 3.6 The deterrent effect of competition investigations is likely to depend greatly on the type of investigation because of the varying processes and tools available to competition authorities. These tools result in different probabilities of being detected and punished, as well as different sizes of fines, thus influencing the degree to which each enforcement measure deters non-compliance (we discuss this further in section 3.28). We briefly review the evidence relating to the different types of investigations below.

Cartel investigations

- 3.7 The Deloitte (2007) study estimated that, according to the results of the legal survey and company survey, the ratio of discovered to deterred cartel abuses was 1:5 and 1:16 respectively. The deterrence ratio from the legal survey should be viewed as a lower bound estimate, as it is possible that there are instances in which legal advice has not been sought before potentially anti-competitive activities were deterred.
- 3.8 Davies and Majumdar (2002) had previously found that the evidence base for assessments of the deterrent effect of competition interventions was mostly confined to cartel investigations. Based on a review of the literature, they concluded that deterrence is very important in making cartel behaviour less pernicious, with attendant benefits for consumers. However, they also found that it was difficult to quantify the magnitude of deterrence effects.
- 3.9 Since the Davies and Majumdar (2002) review, additional studies have analysed the deterrent effect of cartel investigations. In the context of

the vitamin cartel, Clarke and Evenett (2003) found a strong effect of antitrust enforcement regimes on conspirators' decisions to raise prices. After the formation of the international cartels, vitamin prices tended to increase less in countries where cartels were prosecuted and where fines and other forms of sanctions were imposed. This suggests that anti-cartel regimes are effective to some extent in deterring cartel activity.

- 3.10 Other methods which have been used to investigate the deterrent effect of competition enforcement include comparing the level of fines imposed on detected cartels with an estimate of the cartel gains. Connor (2006) found that only in North America did monetary antitrust penalties exceed the monopoly profits of the vitamins cartel. Connor (2006) further argued that the deterrent effect of the financial penalties was sub-optimal for three major reasons: low penalties outside North America; delays in the collection of fines and private action (with no interest charged); and the low probability of cartel detection.
- 3.11 Furthermore, Connor and Lande (2007) compared fine levels imposed by the EC and US authorities to the amounts gained by an average cartel due to their offence. They found that cartels over-charged, on average, by 18-37 per cent in the US and 28-54 per cent in the EU. They also show that, on average, cartel overcharges are significantly larger than the resulting criminal fines of either EU or US authorities. Therefore, Connor and Lande (2007) conclude that both US and EU authorities should increase penalties for hardcore collusion.

Other commercial agreement investigations

- 3.12 Deloitte (2007) found a deterrence ratio of 1:7 for other commercial agreements based on the survey of lawyers and 1:29 in the case of the company survey.

Abuse of dominance investigation

- 3.13 Deloitte (2007) reported a deterrence ratio of 1:4 for abuses of dominance investigations based on a survey of lawyers. This should again be viewed as a lower bound. The deterrence ratio from the

company survey was 1:10. Both deterrence ratio estimates are lower than the corresponding estimates for cartels and other commercial agreements, suggesting that the deterrent effect of enforcement in this area is low compared to enforcement in other areas.

- 3.14 An earlier study by RBB (2003) supports this finding by suggesting that the fine of £6.8 million (a large fine in the context of Genzyme's UK sales of Cerezyme) does not send a clear deterrent message compared to other competition cases. However, in a case such as Genzyme, the offence is arguably not as clear as in other types of competition cases because, by obliging the dominant firm to un-bundle its products and thereby providing a more level playing field for competition, the intervention could have led to a decrease in consumer welfare. RBB (2003) further argued that the decision resulted in a shift of focus from competition to compliance with competition law thus causing over-deterrence.
- 3.15 Related to the arguments put forward by RBB (2003), some academic literature (Bork, 1978; Lear, 2006) suggests that over-deterrence is most likely to occur in abuse of dominance cases.

Merger investigations

- 3.16 A number of studies mention the importance of deterrence with respect to merger policy (Joskow, 2002; Crandall & Winston, 2003; Baker, 2003). However, very few studies go further to analyse in depth the deterrence effects arising from with merger policy (Davies and Majumdar, 2002).
- 3.17 Sorgard (2009) notes three recent studies (Seldeslachts, Clougherty and Barros, 2009; Deloitte, 2007; Twynstra, 2005) that have shown that the deterrent effect of merger policy is 'probably substantial':
- Based on the results of the legal survey, Deloitte (2007) found a deterrence ratio of 1:5, which should be interpreted as the lower bound of the number of mergers abandoned or modified as a result of merger investigations.

- These results are consistent with evidence from surveys of competition lawyers in the Netherlands, which have found that the existence of Dutch merger policy leads to abandonment of 7.5 potential mergers for each enforcement action per year and alteration of 15 mergers per year; thus, 22.5 mergers per year are ultimately affected (Twynsta 2005).
- Seldeslachts, Clougherty and Barros (2009), who estimate the deterrence effect of different types of merger policy tools, found that blocked mergers result in deterrence effects in terms of future merger frequency. However, both negotiated settlements and monitoring appear to have no impact on future mergers and, therefore, appear to be weak policy tools.

Potential unintended effects of competition enforcement

- 3.18 Although severe penalties and a high probability of detection of anti-competitive behaviour can generally be expected to lead to greater deterrence and more compliance with competition law, too aggressive penalties and enforcement practices may raise issues of proportionality, lead to over-deterrence, impact market structure and give rise to concerns that enforcement errors cannot be ruled out (London Economics, 2009).

Enforcement errors

- 3.19 Enforcement agencies cannot rule out the possibility of errors. The literature recognises two common types of errors in public enforcement of law (Png, 1986):
- Type I errors: Falsely finding an infringement. This diminishes the difference between expected fine from violating and not violating the law, thereby lowering the deterrence effect.
 - Type II errors: Falsely clearing a potential infringement. This also lower deterrence as it increases the difference in gains between infringing and not.

- 3.20 Schinkel and Tuinstra (2006) found that, when competition law enforcement is imperfect, welfare is greater if competition authorities are less 'zealous'. They speculate that the criminal system in the US is less prone to erroneous decisions than the administrative law regime in Europe.

Proportionality

- 3.21 Proportionality suggests that the level of sanctions imposed should be related to the harm caused, taking account of not only the illegal profit raised but also the costs imposed on others as a result of the illegal activity. Fines therefore should be calculated based on the welfare cost of the cartel (Posner, 2001).
- 3.22 Other academics have also argued in favour of determining fines based on actual harm caused (Wils, 2006). If fines are excessive it may also imply insolvency of infringers and, while this may have a deterrence effect, in certain markets losing one or more competitors, due to infringement actions, may significantly weaken competition and ultimately hurt consumers in that market (Werden and Simon, 1987; Craycraft et al., 1997).

Over-deterrence

- 3.23 As argued by, for example, Buccirosi et al (2009), excessive competition enforcement may lead to over-deterrence (business chilling) where businesses become too cautious and refrain from undertaking competitive activity because of fear that the activity may be deemed anti-competitive.¹⁰ Furthermore, businesses may face costs associated with ensuring compliance, and over-deterrence may imply that compliance activities and hence compliance costs are excessive.

¹⁰ OFT (2008) also argues that enforcement policies can lead to over-deterrence if the enforcement process seeks objectives other than economic benefits, which may lead to harmful outcomes, from an economic perspective.

- 3.24 The issue of over-deterrence is closely linked to the risk of enforcement errors because, in some cases, it may be difficult to distinguish anti-competitive behaviour from behaviour that should raise no competition concerns. For example, competitive pricing policies, effective advertising campaigns, and the efficient management of resources may be mistaken for anti-competitive behaviour (Demsetz, 1974). In addition, academics such as Robert Bork and Richard Posner suggest that, in antitrust cases, it is not always apparent whether anticompetitive behaviour is occurring or whether it is simply just good competition (Schinkel and Tuninstra, 2006).
- 3.25 Similarly, some academics argue that caution is needed in relation to merger control because it may be difficult to determine whether a significant lessening of competition is likely to occur and, if so, whether it results in a net consumer detriment once efficiency gains are accounted for (Schinkel and Tuninstra, 2006). Therefore, some academics argue that competition interventions may harm competition itself by prohibiting welfare enhancing activities (Bork, 1978).
- 3.26 In addition to enforcement errors, non-proportionality of sanctions may cause over-deterrence. Van Cayseele and Camesasca (2007) argue that the 2006 EC fining guidelines risk over-deterrence as fine determination is not fully related to an estimate of the likely harm caused.
- 3.27 Deloitte (2007) defines business chilling as deterring business behaviour that is neutral or pro-competitive. The study finds that regarding merger regulation, business chilling was generally perceived as occurring rarely or never. In contrast, there was significant concern among advisors and companies in the UK that business chilling can result from fear of prosecution concerning behaviour that could be perceived as an anti-competitive agreement. The study also finds that the fear that firms' behaviour might be assessed as a cartel by competition authorities is the most common form of business chilling in the UK. Typically, this occurs when suppliers wish to implement a promotion by requiring retailers to cut their prices. Concerned that this may be seen as vertical price fixing, suppliers refrain from it, even though it could be beneficial for consumers.

Enforcement tools

- 3.28 In general terms, the deterrent effect of enforcement tools depend on two factors:
- the probability of detection, and
 - the severity of the sanction if detected.
- 3.29 The probability of detection depends, among other things, on resources available to competition authorities and on the design of leniency programmes which may serve to destabilise cartels by creating incentives to betray other members of the cartel. In addition, settlement policies may impact the probability of detection by freeing up resources for other enforcement activities.
- 3.30 The severity of sanctions from the point of view of businesses depends on the totality of sanctions (fines, private actions, reputational damage, etc.). However, for sanctions to be effective, there may also need to be sanctioning at the individual level. Very high fines imposed at firm level may be ineffective in preventing a manager from infringing if she/he personally gains more from the infringement than he loses when the company is fined. Although companies may have internal sanctions in place to deal with managers who engage in anti-competitive behaviour, the incentives of managers and firm owners may not be perfectly aligned. For example, a manager may be able to achieve high profits (and high pay if pay is linked to profit) through collusion while exerting relatively low effort. As a result, managers may have an incentive to collude, even in cases where firm owners prefer not to collude (Aubert, 2007). Individual sanctions in the UK include individual fines, director disqualification orders and imprisonment.

Fines

3.31 Fines on firms and individuals are generally found to reduce the incentive to engage in anti-competitive behaviour.¹¹

3.32 However, there is a debate in the relevant literature over whether predictability of fines enhances or diminishes the deterrent effect of competition law. Wils (2006) argues that there are three reasons why predictability of fines might reduce the deterrence effect:

- If executives, who plan to infringe, are risk-averse, predictability of fines may reduce the deterrent effect of fines because it reduces the risk associated with engaging in anti-competitive activity and being sanctioned.
- In addition, highly predictable fines may imply that it is easier for companies to determine whether it is beneficial to infringe. As a result, companies which would otherwise have been law-abiding might conclude that it is in their interest to infringe.
- Finally, for cartels it is also important to consider the impact on cartel stability. Cartels are generally less stable if it is difficult to reach agreements over risks and rewards. Uncertainty with respect to potential fines and different fines for different cartel members depending on their role in the cartel therefore increases the variation in costs between different members of a cartel, thereby making cartels more unstable.

3.33 On the other hand, if combined with a leniency programme, predictability of fines may enhance deterrence because the knowledge that immunity will be granted to the 'whistle-blower' is a very important element of a successful leniency programme (London Economics, 2009).

¹¹ Empirical evidence is presented and discussed in relation to cartel investigations below.

Imprisonment

- 3.34 In the UK competition regime, prison sentences only apply for breach of the cartel offence under s.188 of the Enterprise Act 2002, which inter alia involves proof of dishonesty on the part of the individual. Imprisonment is an individual sanction and forms part of an effective competition penalty regime (London Economics, 2009).
- 3.35 Gallo et al. (1994), for example, analyse criminal antitrust prosecutions undertaken by the US Department of Justice between 1955 and 1993. They show that, when imprisonment is incorporated as part of the penalty, price-fixing infringement is more effectively deterred.

Director disqualification orders

- 3.36 Compared with fines, DDOs¹² are harder for a company to absorb on behalf of the director than a personal fine. Therefore, DDOs can be more effective in deterring infringements at the individual level than fines (at both individual and firm level).
- 3.37 Although not as far-reaching (or costly for society) as a prison sentence, the personal financial ramifications of DDOs should have a strong deterrent effect on individuals considering committing competition infringements (Stephan, 2011). Therefore, Wils (2008) argued that 'While not being an equally effective alternative to imprisonment, director disqualification would [be] a defensible second best'.
- 3.38 However, in order for this deterrent effect to be felt, disqualifications must be applied and enforced effectively. In this respect there are several potential issues with DDOs (Stephan, 2011):
- First, it has been argued that the circumstances under which DDOs can be applied favour larger companies because it is less likely that a

¹² Also known as Competition Disqualification Orders (CDOs)

director in a small company would be able to argue that he did not or should not have known about offences been committed.

- Secondly, the OFT has stated that it 'will not apply for a DDO against any current director of a company whose company benefited from leniency in respect of the activities to which the grant of leniency relates'. This implies that the deterrence effect of DDOs is significantly reduced because directors are safe in the knowledge that as long as they co-operate once discovered they will not be given a DDO.¹³
- DDOs can only be used against directors and they are not necessarily directly responsible for the infringement.
- In addition, the deterrent effect is likely to depend on how close the director is to retirement.
- There are also problems associated with enforcing disqualifications and ensuring that individuals do not go on to take up senior positions of responsibility within the same or other companies. This is particularly a problem in relation to companies abroad. The fact that there are no DDOs in EU law and not necessarily equivalents in other countries means that someone subject to a DDO in the UK could take up a director's position abroad, as there is no effective information exchange.

3.39 Empirically, no evidence exists which suggests that DDOs have a large deterrent effect. A study conducted in 1997 suggests that disqualification is not in itself a major impediment to finding work (Hicks, 1998) and the willingness of firms to employ executives who have served jail sentences for antitrust offences in the US shows the retained value of their expertise and skills in the job market (Stephan, 2008).

¹³ This adds weight to the argument that leniency agreements are predominantly used not to break up cartels but by infringers once they have been caught.

- 3.40 In addition, Hicks (1998) found that the threat of a DDO had little effect on how directors run their businesses. Moreover, there was a widespread perception that a disqualified director could be involved in running a company without much chance of being caught. Further studies on disqualifications in the context of insolvency also show very limited preventative effect (Williams, 2007).
- 3.41 Furthermore, empirical evidence from the 1990s shows that, at that, time only 58 per cent of company directors in the UK had ever heard the provisions relating to disqualification (Ong, 1998).

Private action

- 3.42 The idea of using private enforcement through the claiming of antitrust damages first began appearing in mainstream academic literature in the 1980s (Salop and White, 1986; Salant, 1987; Baker, 1988).
- 3.43 Private actions (either prior, at the same time or after public infringement actions) can add significantly to the deterrence effect of a regime (UK Department of Trade and Industry, 2001; Calkin, 1997) by increasing the costs to infringers through damages.
- 3.44 Private action is also the main channel through which victims of anticompetitive behaviour can receive compensation for the harm they suffered (OFT, 2007) and private enforcement is sometimes argued to be more efficient than public enforcement, particularly if citizens have better information on the potential infringement (Polinsky and Shavell, 2000; Buccirosi and Spagnolo, 2007). For example, McAfee et al (2008) argue that private actors are more likely to possess information about antitrust violations and have greater incentive to seek enforcement than public bodies. This means that private action can also improve the probability of detection.
- 3.45 However, firms may also be more likely to use antitrust lawsuits strategically to the detriment of competitors and consumers (McAfee and Vakkur, 2004).

Reputational damage

- 3.46 Reputational damage, like private actions, may significantly reinforce the deterrent effect of competition enforcement. Research on stock market responses to antitrust decisions adds to the debate on whether antitrust enforcement causes reputational damage. It is standard in event studies to interpret the stock price reaction as the market's best estimate of the change in value of the company as a result of an event. Bosch and Eckard (1991) argue that the stock price drop can be decomposed into foregone future profit, loss of reputation, and legal costs. If the decline in market value is greater than the magnitude of the fine and legal costs, it can be interpreted as an indication that the market expects future profitability and reputation to be diminished. This can be an important deterrent for other companies.
- 3.47 Gunster and van Dijk (2011) aim to identify the damage to a firm's reputation from competition enforcement actions within Europe. Using a sample of 253 companies involved in 118 European antitrust cases over the period 1974-2004, they find a significant negative stock price response of almost five per cent around the dawn raid, two per cent around the final decision and a significant positive response of up to four per cent around a successful appeal. Gunster and van Dijk (2011) estimate the total reduction in the market value of the 253 companies at €24 billion. Seventy-five per cent of this total cannot be accounted for by fines and legal costs and instead reflects reputational damage resulting in anticipations of significant decreases in future profitability as a result of the enforcement action.
- 3.48 The magnitude of the stock market response depends on several factors including the fine, the duration of the infringement and, in particular, the size of the firm and media attention. Small firms suffer more from an infringement decision than large firms. In addition, greater newspaper coverage is associated with a more pronounced response.
- 3.49 However, Langus and Motta (2007) argue that, the fact that fines only account for a small fraction of the loss in market value for firms associated with antitrust investigations, is evidence of the effectiveness

of the intervention and loss of a profitable activity (for example, price-fixing) rather than reputational damage.

Leniency policy

- 3.50 As discussed in the London Economics (2009) report, leniency and settlement policy are important features of an effective enforcement regime, but each can have offsetting effects on deterrence. Well designed leniency programmes increase the probability of detection and undermine the stability of anti-competitive agreements because all cartel participants have improved incentives to come forward and provide information to competition authorities.
- 3.51 Leniency is a good way for competition authorities to obtain information on a cartel, as there is no clear incentive for cartelists to provide incorrect information. However, it only works if cartelists fear that there is a risk of being detected by competition authorities.
- 3.52 The game-theoretical literature surrounding leniency is ambiguous over its overall effect. The common finding is that it should destabilise cartels as conspirators can simultaneously cheat and apply for leniency (Spagnolo, 2004; Chen and Harrington, Jr. 2007; Harrington 2008). In addition, conspirators can exploit the policy to raise rivals' costs in subsequent periods and hence give themselves a competitive advantage (Ellis and Wilson, 2003).
- 3.53 However, reduced fines for the whistle-blower reduces the average sanction and, as a result, collusive arrangement may in some cases become more stable (Spagnolo, 2000; Ellis and Wilson, 2003; Chen and Harrington, 2007) and easier to form (Motta and Polo, 2003; Harrington 2008) when leniency programmes are in place.
- 3.54 As a result, the overall deterrent effect of financial penalties may be reduced by leniency programmes. In addition, there are ethical issues associated with allowing wrongdoers to escape prosecution (Buccirossi and Spagnolo, 2007). However, if competition authorities have limited resources and, therefore, are unable to prevent collusion ex ante, then a

leniency program may be a second best solution because it improves welfare ex post by making it more likely that a cartel is detected and punished (Motta and Polo 2003).

- 3.55 There is agreement in the academic literature that the effectiveness of leniency programmes depends crucially on the design of the programme. However, there is no agreement as to how the optimal programme should be designed. Motta and Polo (2003) show that the effectiveness of the programme depends on whether cartel members can apply for leniency even after a formal investigation has begun. In their model limiting eligibility to leniency programmes to just those cases where the inquiry has not been opened eliminates the incentive to reveal information and hence the effectiveness of the programme. Therefore, they conclude that leniency programmes should apply even to firms that reveal information after an investigation has started.
- 3.56 In contrast, Spagnolo (2000) finds in his model that the optimal leniency policy should be restricted to the first party to report. Allowing more agents to obtain leniency makes the programme more easily exploitable and it reduces the maximum reward that can be offered to the first party that reports. Similarly, Motchenkova (2004) finds that cartels are less likely if the rules of leniency programmes are stricter and the procedure of application for leniency is confidential. When the application process for leniency is not confidential and penalties and law enforcement frequency are low, leniency may increase the duration of cartel agreements.
- 3.57 Empirically, most evidence points to a positive deterrent effect of leniency programmes. For example, an investigation of the impact of leniency programmes on cartel enforcement in the US over a 20-year period found that leniency programmes led to a significant reduction in cartel formation and a significant increase in cartel detection (Miller, 2007).
- 3.58 Similarly positive findings have been reported for the EU. Brenner (2009) found that the 1996 EU Leniency Programme provided incentives to divulge information on cartels, which meant that agencies became better

informed than they would have been without the programme. It also led to a quicker investigation and prosecution of cartels, although he did not find conclusive evidence supporting the idea that the leniency programme provided the appropriate conditions to destabilise cartels.

- 3.59 Using a behavioural experiment Bigoni, Fridolfsson, Le Coq, and Spagnolo (2008) find that leniency programs are likely to deter a significantly higher fraction of cartels from forming, but induce even higher prices in those cartels that are not reported.

Early resolution

- 3.60 Settlement policies might also raise concerns about reduced deterrence. Polinsky and Shavell (2000) argue that settlements can dilute deterrence as they lower the costs to infringers relative to the levels of penalties they would otherwise expect. In order to avoid such a situation, sanctions have to be increased to offset this settlement-related reduction in deterrence.
- 3.61 However, there is also a countervailing effect. More efficient use of resources can enable detection and prosecution of more offenders, thus potentially enhancing overall deterrence (De Azevedo and Henriksen, 2010; OECD, 2008). For example, Nikpay and Waters (2008) argue that early resolutions can enable the OFT to focus on more high-impact projects, thereby increasing the overall deterrent effect of their work.
- 3.62 It is worth noting that both the OFT and companies may benefit from lower investigation and legal costs. In addition, they avoid the possibility of lengthy appeals and companies may benefit from the certainty provided by having agreed the level of penalty early on. However, possible disadvantages of early settlement policies are that they lead to reduced transparency in investigations and the possibility that settlements may be challenged by third parties on grounds of unequal treatment (Mitchell, 2008).
- 3.63 The literature has also pointed to important interactions with other aspects of the enforcement regime. First, the fact that firms must admit

liability in order to gain an early resolution leaves them more open to private cases and follow-on damages being brought against them (Nikpay and Waters, 2008). This interrelated nature of private actions and early resolution may reduce the incentives for companies to use early resolution procedures. But, at the same time, there is a potentially added deterrence effect of early resolutions coming from private actions.

- 3.64 There are also interactions between settlement and leniency programmes. Nikpay and Waters (2008) argue that early resolutions may reduce incentives for companies to come forward under leniency programmes, as they can still receive a discounted punishment through early resolution if the illegal activity is detected. Therefore, settlement discounts must be calibrated carefully to avoid the risk of reducing the incentives of companies to co-operate under leniency (OECD, 2008).

Relative importance of sanctions

- 3.65 Deloitte (2007) identified key factors driving compliance with competition law and found that criminal penalties were ranked as the most important factor in 'deterring infringements' by both lawyers and companies. There was also agreement among lawyers and companies that director disqualifications and adverse publicity are more important to deterrence than private damages actions. Companies considered director disqualification and adverse publicity more important than fines, while lawyers considered fines the second most important factor deterring anti-competitive behaviour.
- 3.66 Furthermore, in response to the question of what more can be done to deter competition law infringements in the UK, more criminal prosecutions, increased publicity and education; greater encouragement of private damages actions, faster decision taking and more decisions/greater enforcement activity were suggested by survey participants.
- 3.67 Building on this earlier research, the OFT has recently published research into the 'Drivers of Compliance with Competition Law' (OFT 2010c). This research was based on qualitative interviews with larger business

and their responses suggest that, consistent with Deloitte (2007), key drivers of competition law compliance are fear of reputational damage, financial penalties, individual sanctions (such as director disqualification and risk of criminal proceedings), and commitment to compliance from the top of the organisation. OFT (2010c) also found that factors that increase the risk of non-compliance include lack of management commitment, confusion or uncertainty about the law and rogue employees.

Compliance measures

3.68 While most businesses have adopted a risk-based approach to competition law compliance which typically forms part of a broader compliance agenda that also includes compliance in areas such as health and safety, environmental protection and anti-bribery and corruption, the OFT (2010c) recognises that appropriate actions to achieve a compliance culture will vary by size of business and the nature of the risks identified.

3.69 The OFT offers advice to companies on how they can ensure that their company is compliant with Competition Law (for example, OFT Quick guide to Competition Law Compliance 2009). In line with the conclusions of OFT (2010c), the OFT emphasises the importance of instilling a general compliance culture within the organisation. The OFT argues that this can be achieved through a four-step process of tackling specific risks:

- **Risk identification:** This involves assessing whether any areas of the business risk breaking competition laws. This includes identifying whether any employees have contact with competitors at industry events or have knowledge of competitors' prices or business plans; whether the business has a large market share; whether there are agreements containing joint selling and purchasing provisions with competitors and several other areas which could contravene competition law.

- **Risk assessment:** Having identified the key competition law compliance risks it faces and the areas of the company's conduct in which these risks may exist, the business should assess the seriousness of these risks and assess how many employees are in high risk areas.
- **Risk mitigation:** This stage involves setting up policies, procedures and training to reduce the likelihood of the risks turning into problems. This includes training employees in competition law, implementing an employee code of conduct policy, and other processes to ensure that employees do not contravene competition law.
- **Review:** The final suggested step is a review stage. It is suggested that a business's commitment to compliance and the steps above are reviewed regularly to ensure that the business has an effective compliance culture.

3.70 However, compliance practices should not necessarily translate into lower sanctions. Wils (2006) argues that compliance programmes may reflect a genuine commitment to antitrust compliance at the highest levels within the company, and that well-designed, compliance programmes can both help prevent antitrust violations and detect such violations as early as possible. However, compliance programmes should not necessarily translate into reduced fines because, if fines are set at the adequate level required for deterrence, companies will already have all the necessary incentives to prevent antitrust infringements. Similarly, Calkins (1997) notes that companies have many ways to increase internal compliance and that the government should set out penalties and leave it to firms to determine how best to deal with the threat of these penalties.

4 DRIVERS OF COMPLIANCE

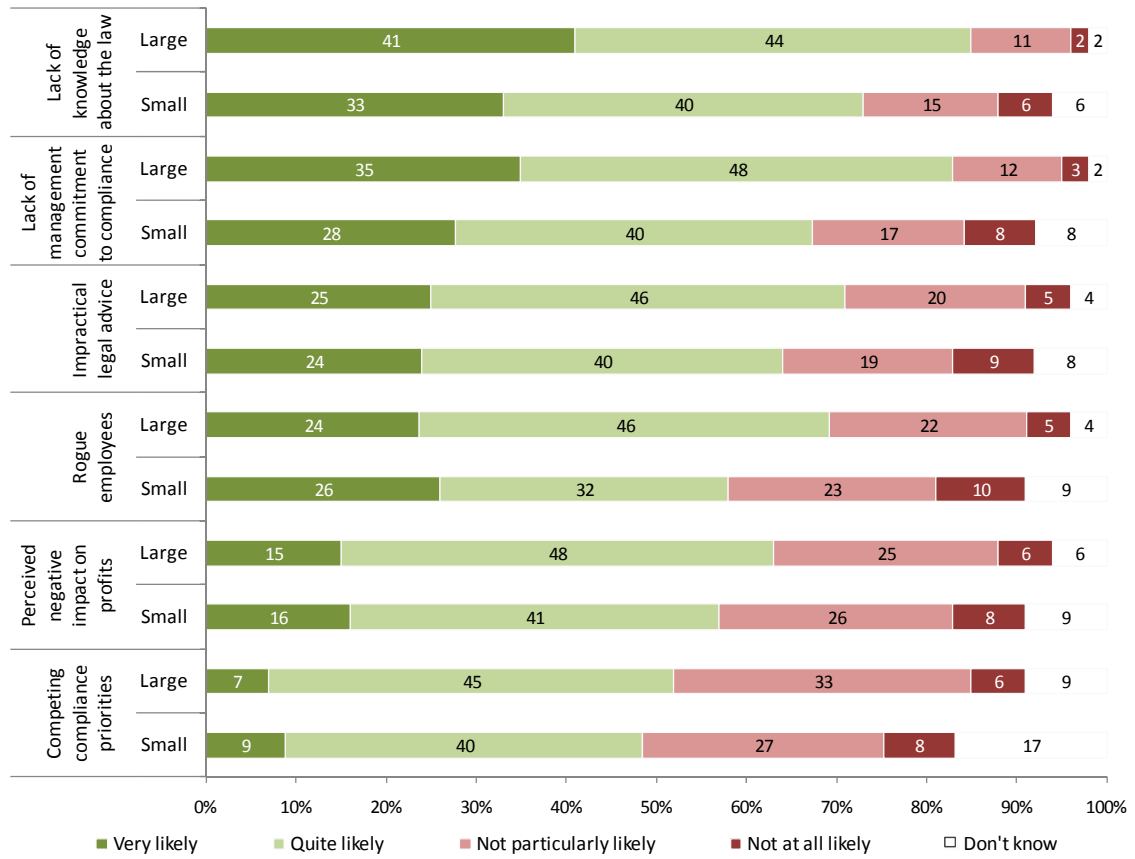
- 4.1 Many different factors may drive compliance and non-compliance with competition law by businesses. This chapter analyses survey evidence of what businesses, business stakeholders, and legal professionals perceive as the most important drivers of non-compliance.
- 4.2 Based on this analysis, we develop a compliance typology which sets out the three main pillars of competition compliance. This typology of compliance forms the basis of subsequent chapters.

Drivers of non-compliance

- 4.3 The results of the business survey shows that small and large businesses agree that the most important driver of non-compliance with competition law is lack of knowledge about the law. A total of 85 per cent of respondents from large companies and 73 per cent of respondents from small companies noted that lack of knowledge about the law was very or quite likely to increase the risk of non-compliance (Figure 4.1).
- 4.4 This finding somewhat contrasts with the views expressed by the two business stakeholders interviewed for the study who argued that lack of knowledge of competition law is now an unlikely reason for non-compliance and comes up only occasionally (and only for small companies). Business stakeholders generally suggested that problems with lack of knowledge were relatively limited and that appropriate OFT guidance is available and known to businesses. However, the results of the business survey suggest that there are still significant knowledge gaps, particularly among small businesses.
- 4.5 The second most important driver identified by businesses is lack of management commitment to compliance. Management commitment is likely to be closely related to a general culture of compliance within companies. Business stakeholders interviewed for the study highlighted that a culture of compliance is one of the most important drivers of compliance. They further argued that a culture of compliance involves everyone knowing that competition law is important.

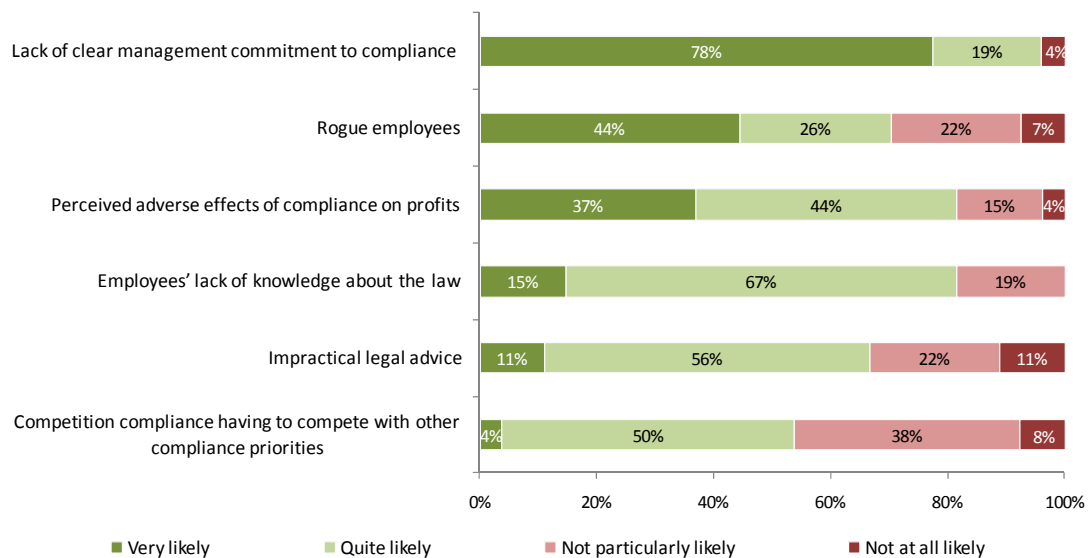
- 4.6 Legal professionals indicated that lack of clear management commitment to competition compliance is the greatest driver of non-compliance (Figure). The other most important factor identified by legal professionals was weak enforcement of competition law. In particular, legal professionals suggested that competition law tribunals are too lenient, that the OFT is not investigating enough cases, and a lack of consumer class actions. This view was also shared by the business stakeholders.
- 4.7 Of lesser importance for businesses are perceptions of a negative impact on profits. Although this suggests that businesses in general do not see reduced profits as one of the main drivers of non-compliance, the qualitative interviews with business stakeholders placed relatively more emphasis on financial issues as one of the drivers of non-compliance. In particular, business stakeholders argued that compliance might be compromised by highly entrepreneurial managers who might feel that their reputation would not be damaged by an investigation into anti-competitive behaviour. Instead, such managers may feel that overstepping the mark might demonstrate to their shareholders that they are actively pushing the boundaries. In addition, they argued that non-compliance might be a consequence of risk-taking and financial pressures.
- 4.8 Finally, according to the results of the business survey, the least important driver of non-compliance is that competition compliance must compete with other compliance efforts for resources. This view is mirrored in the results of the legal survey (Figure 4.2). While the majority of legal professional respondents believe that competition with other compliance priorities was very or quite likely to increase non-compliance, it is worth noting that the results nevertheless suggest that it is the least important factor affecting non-compliance. In addition, one respondent argued that the extent to which this was the case depends on the specific circumstances. For instance, the risk of non-compliance might be larger if the company works in a heavily regulated market with many compliance obligations.

Figure 4.1 Business survey: Impact of different factors on the risk of non-compliance with competition law (per cent of respondents)



Source: Business survey. Based on 308 responses for small companies and 501 responses for large companies.

Figure 4.2: Legal survey: Impact of different factors on the risk of non-compliance with competition law



Source: Legal survey. Based on 27 responses.

Differences in responses by different types of businesses

4.9 Interestingly, respondents from large companies seem more alert to the potential drivers of non-compliance. For each of the factors considered, a larger share of respondents from large companies than from small companies believes that they are very or quite likely to increase the risk of non-compliance.¹⁴

4.10 Further analysis of the survey results by sector reveals that businesses in sectors with one or more competition law (cartel, commercial agreement or abuse of dominance) investigations since 2003 are more likely to

¹⁴ The differences are mostly statistically significant at a five per cent level of confidence using a one-sided test of unpaired samples with unequal variances. The only exception is 'competing compliance priorities'. In this case the difference is not statistically significant.

believe that lack of management commitment increases the risk of non-compliance with competition law compared to businesses in sectors with no competition law intervention since 2003.¹⁵

- 4.11 Businesses from sectors with no competition law investigation since 2003 were, however, more likely to view perceived negative impacts of compliance costs on profits as a risk to compliance. This could suggest that the further businesses are removed from OFT interventions, the more they focus on the costs associated with compliance relative to the costs associated with non-compliance (and lack of management commitment).
- 4.12 The sectoral analysis further suggests that businesses in sectors with one or more merger investigations since 2003 are more likely to view impractical legal advice as a driver of non-compliance.

The three pillars of competition compliance

- 4.13 Three main drivers of competition compliance emerge from the survey evidence. These drivers are also identified in the OFT's study 'Drivers of compliance and non-compliance with competition law' (2010c).
- **Knowledge of competition law:** Both the legal and business survey identified lack of knowledge as a very important driver of non-compliance. In addition, businesses may find that impractical legal advice is a driver of non-compliance because they, as businesses, lack necessary knowledge. Knowledge of competition law constitutes a necessary precondition for the following two drivers of compliance.
 - **Voluntary compliance measures:** Both legal professionals and businesses also indicated a lack of management commitment to

¹⁵ The sectoral analysis is included in Annex D. There are other differences than those mentioned here but these other differences are not statistically significant at the five per cent or 10 per cent level of significance.

compliance as an important driver of non-compliance. Furthermore, business stakeholders and legal professionals argued that a general compliance culture and clear compliance programmes could be important drivers of compliance. It also seems clear that non-compliance with competition law is more likely to be caused by rogue employees and competition with other compliance priorities if no strong competition compliance culture is embedded in the company.

- **Sanctions and enforcement:** Legal professionals also highlighted weak enforcement of competition law as a driver of non-compliance, stressing the role of sanctions and enforcement in ensuring compliance. These interventions by competition authorities increase the costs and decrease the profits from non-compliance for businesses. One of the reasons for non-compliance is the perception that not complying will lead to higher profits for a business than if it adheres to the law (Becker 1968). Hence, by decreasing the likely financial gains from deviant behaviour, enforcement and sanctions imposed by competition authorities can undermine profit considerations as a source of non-compliance.

- 4.14 The key role of these three factors as main drivers of compliance with competition law has already been highlighted by previous studies, providing support to the above compliance typology employed in the remainder of this study.
- 4.15 The relevance of knowledge about competition legislation as a driver of business compliance is confirmed in a previous publication by the OFT (2008), which emphasises that competition authorities' approach to enforcement requires clarity and consistency. It notes that the resulting legal certainty among companies will encourage pro-competitive behaviour by businesses, making it easier for them to anticipate how their conduct will be assessed by the authorities. Thus, knowledge of competition law constitutes one of the main drivers of compliance with competition regulation.

- 4.16 The role of sanctions and enforcement in promoting business compliance is highlighted in another study by the OFT (2009), and is further illustrated by the standard economic theory of crime, which assumes that compliance with the law constitutes a rational choice of individuals and firms (Becker 1968). According to this theory, economic agents will refrain from illegal activity if the expected penalty (depending on the probability of being detected and punished and the monetary value of the sanction) exceeds the gains (for example, the financial benefits from participating in a cartel) from non-compliance. Thus, competition authorities can enforce business compliance by imposing sanctions on businesses which deviate from the law, that is, by influencing the size and probability of the penalty which companies anticipate as a result of their non-compliance.
- 4.17 Finally, more recent research conducted by the OFT (2010c) identifies all three factors as significant drivers of compliance. Knowledge and awareness is important in helping businesses identify the key compliance risks they face, and determine how to assess these risks and how to mitigate any risks so that breaches of competition law are avoided in the first place. Businesses' awareness of specific interventions is also important for how business identify risk areas. Sanctions and enforcement are important drivers of compliance with competition law as they encourage businesses to focus on competition law compliance, and can aide in ensuring commitment to compliance by senior management. Voluntary compliance measures encompass the broader compliance agenda within the business, including internal practices, information and advice, used by business to ensure that employees are confident and informed about competition law.
- 4.18 The OFT may therefore support competition compliance and improve deterrence through all three pillars. For example, by a) providing guidance and information on compliance measures and risks, b) ensuring the penalties regime is designed to achieve optimal deterrence,¹⁶ and c)

¹⁶ OFT 2009.

facilitating a culture of compliance within firms through efficient and effective provision of the first two pillars.

5 KNOWLEDGE AND AWARENESS ABOUT COMPETITION ISSUES

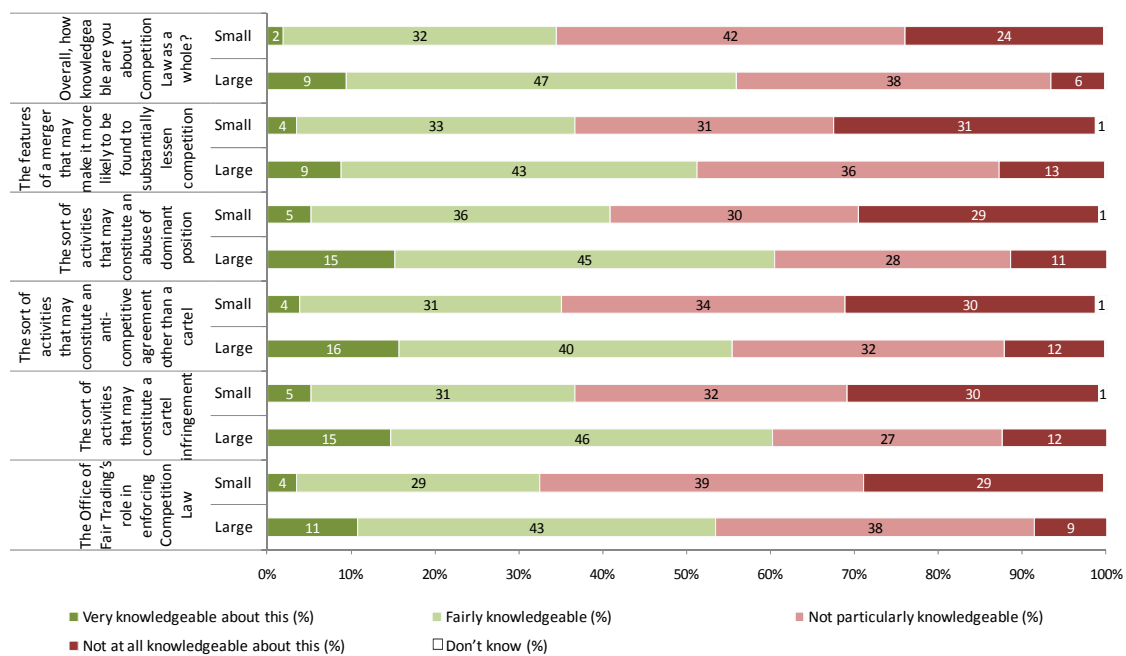
- 5.1 The first pillar of competition compliance by businesses is knowledge. This includes both detailed knowledge about competition law and more general knowledge about the role of the OFT, what the broad types of anti-competitive behaviour are, awareness of guidance and tools provided by the OFT, and awareness of specific competition interventions and investigations.
- 5.2 The present chapter analyses business knowledge and awareness using evidence from the business survey. First, the chapter analyses knowledge about basic aspects of competition law before moving on to an analysis of more specific concepts. The chapter also analyses awareness of OFT guidance and tools based on an assessment provided by business stakeholders. Finally, the chapter explores businesses' awareness of specific competition interventions and investigations.

Knowledge about basic concepts of competition law

- 5.3 For the purpose of this report, the set of basic concepts of competition law are defined to include:
- the OFT's role in enforcing competition law
 - the sort of activities that may constitute cartel activity
 - the sort of activities that may constitute an anti-competitive agreement other than a cartel
 - the sort of activities that may constitute an abuse of dominance
 - the features of a merger that may make it more likely to be found to substantially lessen competition, and
 - competition law as a whole.

- 5.4 In general, small businesses feel less knowledgeable about these concepts than large businesses (5.1). Across all six concepts, less than 50 per cent of small businesses and more than 50 per cent of large businesses felt very or fairly knowledgeable. Overall, 57 per cent of respondents from large businesses and 35 per cent of respondents from small businesses feel very or fairly knowledgeable about competition law as a whole.¹⁷
- 5.5 Both small and large businesses tend to be most knowledgeable about the sort of activities that may constitute an abuse of dominance and cartel activity. However, there is generally little variation across the different aspects studied.

Figure 5.1: Knowledge of basic aspects of competition law by company size



Source: Business survey. Based on 308 responses from small businesses (fewer than 200 employees) and 501 responses from large businesses (200 or more employees).

¹⁷ The difference is statistically significant at a five per cent level of significance.

Differences by sector

5.6 Businesses in sectors where a competition law or merger investigation has been undertaken since 2003 are slightly more knowledgeable about some basic aspects of the competition regime:¹⁸

- For example, 48 per cent of businesses in sectors with a competition law investigation since 2003 feel very or fairly knowledgeable about the OFT's role in enforcing competition law compared to 42 per cent in sectors with no competition investigation.
- Similarly, 48 per cent of respondents in sectors with a merger investigation since 2003 feel fairly or very knowledgeable about the OFT's role compared to 40 per cent in sectors with no merger investigation since 2003.
- Businesses in sectors with experience of recent competition law investigations also tend to be more knowledgeable about competition law as a whole. In particular, 52 per cent of respondents from these sectors feel knowledgeable while the corresponding figure is 43 per cent in sectors with no recent investigation.
- Businesses in sectors with a competition intervention since 2003 are more knowledgeable of competition law interventions and in particular about what may constitute:
 - a cartel infringement. Fifty-four per cent and 48 per cent respectively feel fairly or very knowledgeable about what a cartel may constitute¹⁹

¹⁸ All differences are statistically significant at a five per cent level of significance.

¹⁹ Statistically significant at the 10 per cent level of significance. It should be noted, however, that the data do not show that businesses in sectors with a cartel investigation (as opposed to competition interventions in general) are more knowledgeable about what constitutes a cartel than businesses in other sectors.

- an anti-competitive agreement other than a cartel. In particular, 52 per cent of businesses in sectors with a competition law investigation are fairly or very knowledgeable about this, compared to 44 per cent of businesses in other sectors ²⁰
- an abuse of dominance. Fifty-seven per cent of businesses in sectors with a competition investigation, since 2003, are very or fairly knowledgeable about this. In comparison, 49 per cent of businesses in other sectors are not. ²¹
- Business in sectors with merger investigations are not more knowledgeable about what features of a merger may make it more likely to be found to substantially lessen competition. However, there is a tendency for businesses in sectors with a competition investigation to be report being knowledgeable: Forty-nine per cent of businesses from sectors with a competition intervention claimed to be fairly or very knowledgeable about what features of a merger may make it more likely to be found to substantially lessen competition compared to 43 per cent of businesses in other sectors.²²

Awareness of more specific aspects of the competition regime

5.7 For the purpose of the analysis of specific aspects of the competition regime, respondents were defined as being knowledgeable about competition law if they indicated that they are very or fairly

²⁰ Statistically significant at the five per cent level. The conclusion also holds when comparing companies in sectors with investigations into commercial agreements vs. sectors with no such investigations.

²¹ Statistically significant at the five per cent level of significance. There is no difference when considering sectors with abuse of dominance investigations vs. sectors with no abuse of dominance investigation.

²² Statistically significant at the five per cent level.

knowledgeable about at least one of the concepts in 5.1.²³ This definition was used in order to screen respondents for further questioning. Respondents classified as knowledgeable about competition issues were asked further questions to allow an assessment of the depth of their knowledge.

5.8 Based on this definition of knowledgeable, 56 per cent of respondents from small companies and 74 per cent of respondents from large companies can be classified as knowledgeable about competition law.²⁴ Further, businesses in sectors with a competition law investigation are more likely to be classified as knowledgeable.²⁵

5.9 Respondents were asked to indicate whether they were aware of the following more specific aspects of the competition regime:

- leniency policy (including informant rewards)
- early resolution (also known as settlement)
- commitments to stop or modify behaviour or to change business structures
- the respective roles of the OFT and the Competition Commission in merger control
- short form opinions, and
- 'no grounds for action' and non-infringement decisions.

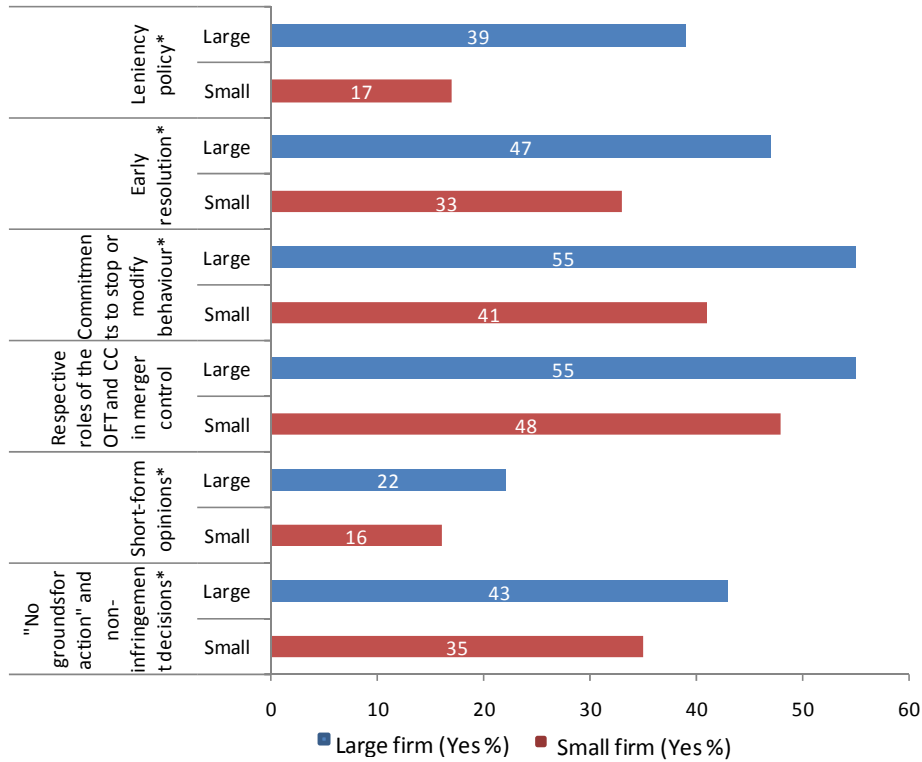
²³ Knowledge about the role of the OFT is not included in this definition.

²⁴ The difference is statistically significant at a five per cent level of significance.

²⁵ Seventy-one per cent of businesses in sectors with an investigation are classified as knowledgeable compared to 63 per cent in other sectors. The difference is significant at the five per cent level. Further, companies in sectors with mergers are neither less nor more knowledgeable about competition law than companies in sectors with no merger investigations since 2003.

5.10 There is a notably low level of awareness of specific aspects of the competition regime given that only relatively knowledgeable respondents were asked the question (Figure 5.2).²⁶

Figure 5.2: Awareness of specific aspects of competition law (percentage of knowledgeable respondents)



Source: Business survey. Based on 174 responses from small businesses (fewer than 200 employees) and 370 responses from large businesses (200 or more employees).

*Indicates that there is a statistically significant difference between large and small firms at the five per cent level of significance using based on one sided t-tests for unpaired samples with unequal variances.

²⁶ As previously stated, 56 per cent of respondents from small companies, and 74 per cent of respondents from large companies, are classified as knowledgeable about competition law.

- 5.11 Of the 174 small companies classified as knowledgeable, less than half indicated awareness of any of the specific aspects considered in Figure 5.2.
- 5.12 There is again a clear tendency that respondents from large companies are more informed about competition issues. The difference between small and large companies is particularly pronounced with respect to awareness of the leniency programme.
- 5.13 The results also suggest that, in the case of the more specific aspects considered, businesses are most knowledgeable about the respective roles of the OFT and the CC and least aware of short-form opinions. It is worth noting that short-form opinions are relatively new and, therefore, it is not surprising that awareness of them is relatively low.
- 5.14 Finally, there are no notable sectoral differences when comparing sectors with and without competition law investigations and sectors with and without merger investigations since 2003.

Business stakeholders' awareness of OFT guidance and tools

- 5.15 According to the interviews conducted with business stakeholders, the awareness of guidance and tools provided by the OFT also varies by company size, and can therefore not be assessed overall. Large companies are aware of the OFT's competition information, whereas small and micro companies generally are less aware. Business stakeholders also argue that firms are most aware about the information pertaining to mergers, and will consult this information on the OFT website when relevant.
- 5.16 Business stakeholders also suggested that the greatest knowledge of guidance is in areas where specific guidance has been provided. For example, the OFT publication 'Guidance on the application of competition law to certain aspects of the bus market following the Local Transport Act 2008' is well known by bus operators. In general, firms have a good understanding of provisions that are relevant to their industry.

- 5.17 Access to OFT information was generally viewed as good by business stakeholders. It was suggested that guidance could be improved, for example, by making greater use of examples and case studies, or by working to shorten guidance (although it was understood this might be difficult while maintaining sufficient detail and completeness). Also, guidance on mergers was described as 'unclear', for example, because of the difficulty for businesses to use the guidance to determine the relevant market boundaries.
- 5.18 Business stakeholders also suggested that businesses generally have a broad understanding of the key tools and policies used by the OFT. For example, stakeholders reported that businesses have a good understanding of leniency policy, and in a couple of instances, there has been a rush to get in the door first to benefit from leniency. However, as seen above, the business survey results suggest that awareness of the leniency programme depends on the size of the business and awareness among small businesses is in fact limited.

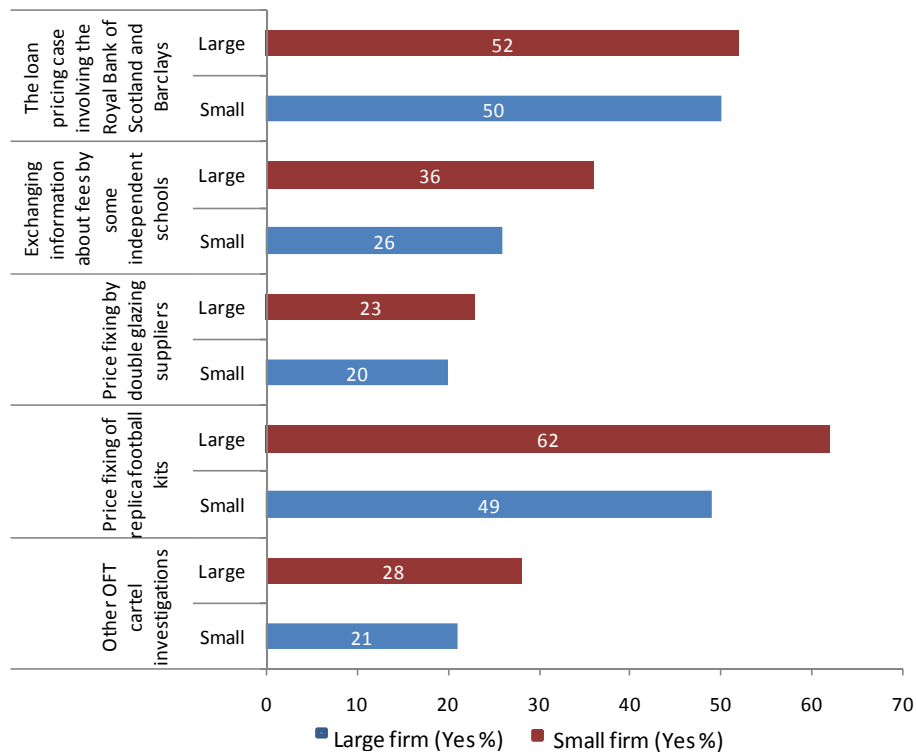
Awareness of specific competition interventions

- 5.19 This section analyses businesses' awareness of specific competition investigations in the areas of cartels, anti-competitive commercial agreements, abuse of dominance and mergers.
- 5.20 For each type of intervention, businesses were asked whether they had heard about a number of specific investigations and if they had heard about any other interventions. This approach was chosen in order to limit the length of the survey and, hence, encourage survey participation while, at the same time, avoiding using an open-ended question approach which might not have captured awareness of any cases if the respondents failed to recall the names of specific investigations. However, the chosen approach may bias the results towards the specific cases as respondents were prompted with specific case names.

Awareness of cartel investigations

- 5.21 Overall, awareness was greatest for the loan pricing case involving the Royal Bank of Scotland and Barclays, and the price fixing of replica football kits.
- 5.22 Generally, respondents from small companies are less aware of cartel cases than respondents from large companies and the differences are statistically different in three cases: price fixing of replica football kits, exchange of information about fees by some independent schools and other OFT cartel investigations.

Figure 5.3: Awareness of cartel investigations by firm size



Source: Business survey. Based on 308 responses from small businesses (fewer than 200 employees) and 501 responses from large businesses (200 or more employees).

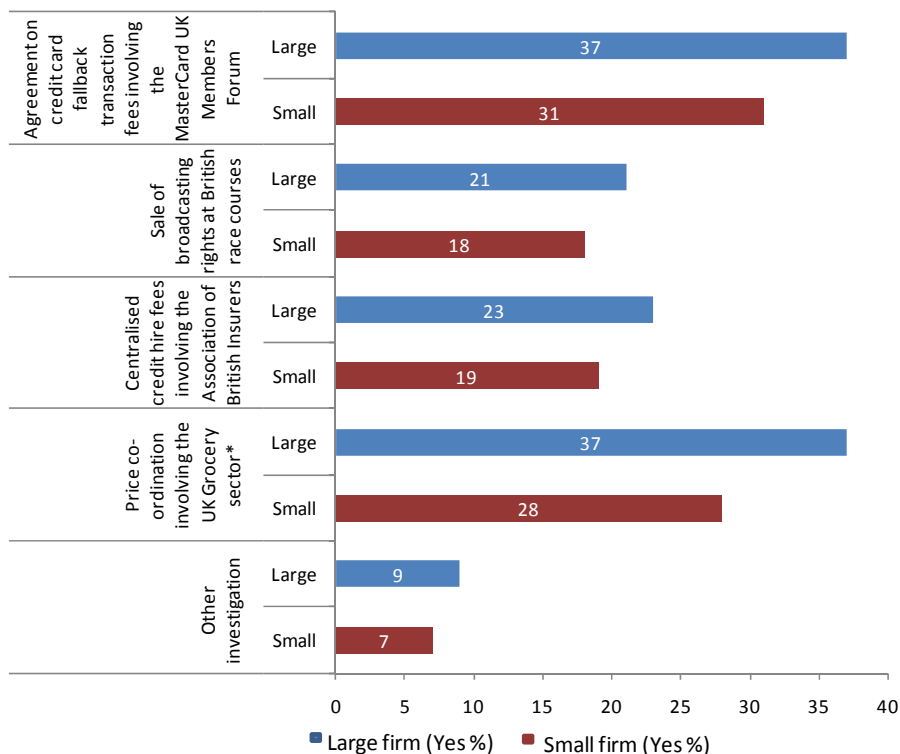
*Indicates that there is a statistically significant difference between large and small firms at the five per cent level of significance using based on one sided t-tests for unpaired samples with unequal variances.

- 5.23 Surprisingly, the survey results do not suggest that businesses in sectors that have been affected by a cartel investigation since 2003 are more aware of specific cartel investigations than businesses in other sectors. Nor is there evidence that businesses in sectors with competition law investigations are more aware of cartel cases than businesses in sectors with no competition law investigations.
- 5.24 Respondents to the business survey were also asked whether they had heard of any other cartel cases. Of the cartel cases pursued by the OFT since 2003, the following cases were mentioned by at least one respondent:
- airline passenger fuel surcharges for long-haul passenger flights
 - bid rigging in the construction industry in England
 - anaesthetists' groups
 - Hasbro UK Limited/Argos Limited/Littlewoods Limited
 - construction recruitment forum.
- 5.25 The most frequently mentioned cases were the airline passenger fuel surcharges case and the investigation into bid rigging in the construction industry.
- 5.26 Respondents also often mentioned fuel and oil, utilities including energy, railways, airlines and supermarket cases, however, without referring to a specific case. Some of these cases would clearly have been the responsibility of the sectoral regulators rather than the OFT. Some respondents also mentioned cases undertaken by the European Commission such as the investigation into price fixing of flat glass.
- 5.27 There also appears to be some confusion over which cases were cartel cases and which cases would not be classified as cartel cases. This implies that while the respondent was aware of the case, they were not certain about what type of competition intervention was involved.

Awareness of investigations about anti-competitive agreements

5.28 Compared to cartel cases, businesses typically seem less aware of cases involving anti-competitive agreements other than cartels and it is notable that awareness does not exceed 50 per cent for any of the considered cases involving anti-competitive agreements.

Figure 5.4: Awareness of investigations about anti-competitive agreements by firm size



Source: Business survey. Based on 308 responses from small businesses (fewer than 200 employees) and 501 responses from large businesses (200 or more employees).

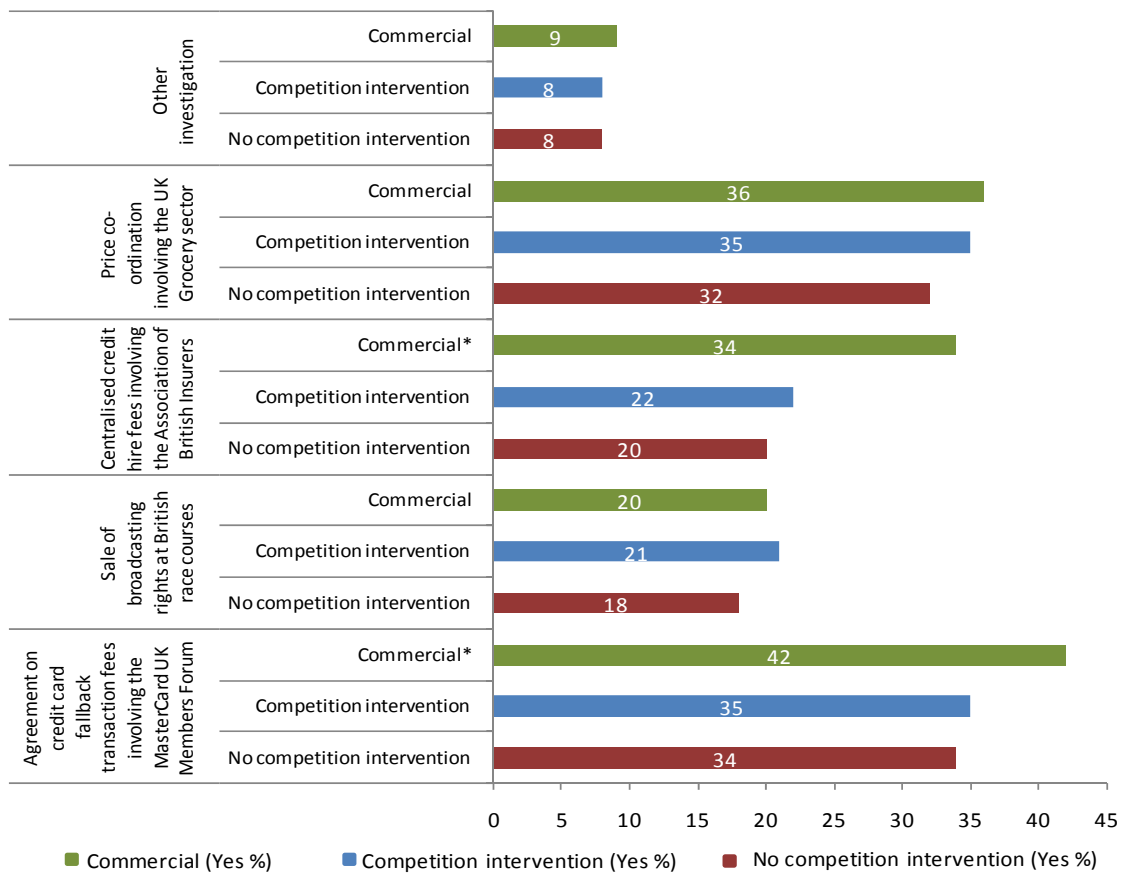
*Indicates that there is a statistically significant difference between large and small firms at the five per cent level of significance using based on one sided t-tests for unpaired samples with unequal variances.

5.29 There is again a tendency that small firms are less aware of investigations than large firms. However, the difference between large

and small firms is only statistically significant in the case of price coordination involving the UK grocery sector.

- 5.30 Contrary to the results for cartel investigations, the results suggest that businesses in sectors where an investigation of commercial agreements has been carried out since 2003 often are more aware of this type of case. In particular, businesses in sectors affected by investigations into potentially anti-competitive agreements are significantly more aware of the case of centralised credit hire fees involving the Association of British Insurers and the agreement on credit card fallback transaction fees involving the MasterCard UK Members Forum (Figure 5.5).

Figure 5.5: Awareness of investigations about anti-competitive agreements by sector



Source: Business survey. Based on 151 responses from businesses in sectors with an anti-competitive agreement investigation since 2003, 429 responses from businesses in sectors with any type of competition law investigation since 2003 and 380 responses from businesses in sectors with no competition investigations since 2003.

*Indicates statistically significant differences at a five per cent level of significance.

5.31 Of the anti-competitive agreement cases undertaken by the OFT since 2003, the following cases were mentioned by at least one respondent, when asked if they had heard of any other investigations into commercial agreements:

- Dairy/Supermarkets
- Cathay Pacific Airways and Virgin Atlantic

- Tobacco
- Association of British Insurers' General Terms of Agreement
- MasterCard UK Members Forum Limited.

5.32 Only two cases were mentioned by more than five respondents. These were BskyB and the airline passenger fuel surcharge cases. Other common sectors mentioned by respondents were related to buses, railways, construction, supermarkets, energy and fuel, although the exact case which they were referring to was not always apparent.

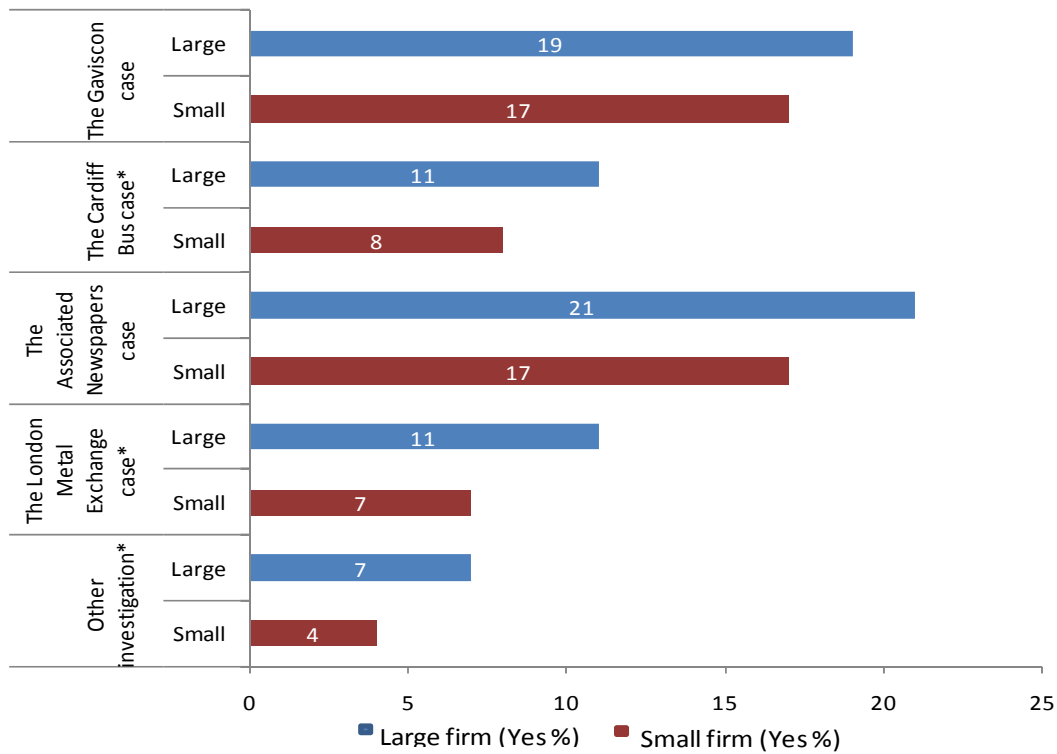
5.33 Some respondents were unclear about which cases should be classified as anti-competitive agreements. Cases involving other types of competition infringements were also mentioned, as well as merger cases (for example, BskyB).

5.34 Respondents also mentioned cases pursued by Ofgem concerning electricity and investigations carried out by the European Commission for example, the investigations into Intel and state aid given to Peugeot and Citroen.

Awareness of abuse of dominance investigations

5.35 There is generally a very low awareness of abuse of dominance cases undertaken by the OFT. Respondents were most aware of the Gaviscon case and the Associated Newspapers case, and were much less aware of the London Metal Exchange case involving E-trading and price discrimination, and the Cardiff Bus case involving price cutting to discourage a new competitor.

Figure 5.6: Awareness of investigations into abuse of dominance by firm size



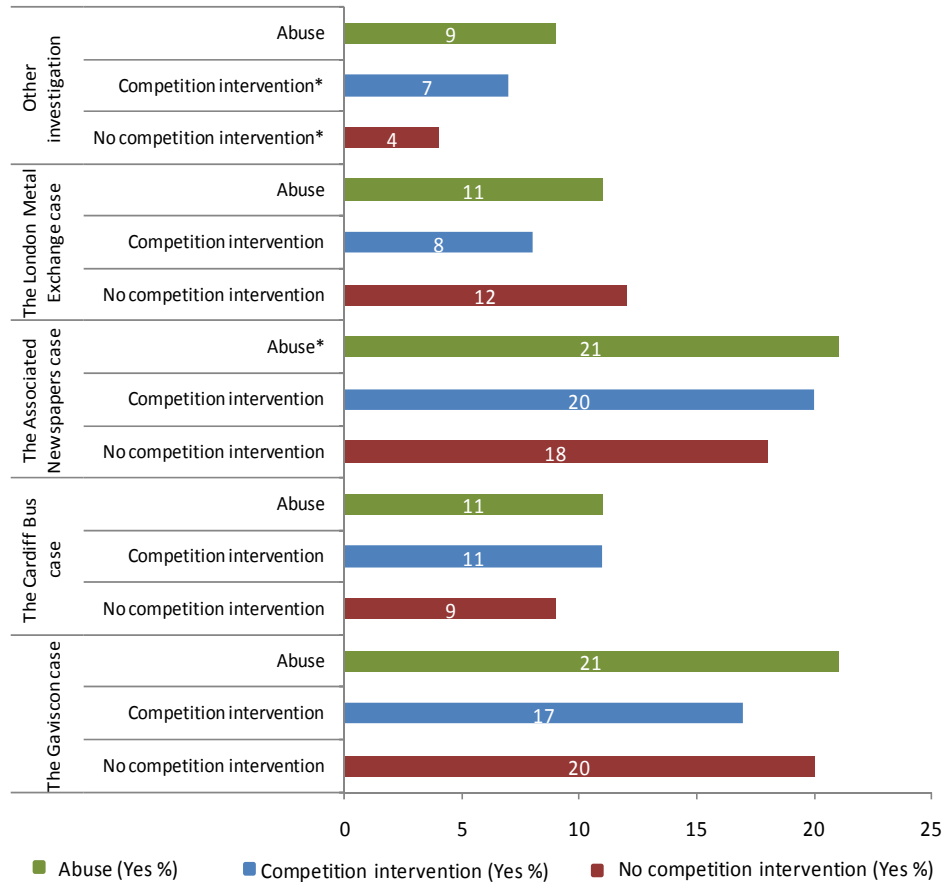
Source: Business survey. Based on 308 responses from small businesses (fewer than 200 employees) and 501 responses from large businesses (200 or more employees).

*Indicates that there is a statistically significant difference between large and small firms at the five per cent level of significance using based on one sided t-tests for unpaired samples with unequal variances.

- 5.36 The survey results further suggest that large companies are significantly more aware of all the cases, with the exception of the Gaviscon case and the Associated Newspapers case. This is most likely because abuses of dominance issues are more relevant to large companies than to small companies.
- 5.37 There is some tendency for businesses in sectors that have been affected by an abuse of dominance investigation to be slightly more aware of the cases considered. However, the difference in awareness between businesses in sectors affected by an abuse of dominance case

and sectors not affected is only statistically significant for the Associated Newspapers case.

Figure 5.7: Awareness of abuse of dominance investigations by sector



Source: Business survey. Based on 179 responses from businesses in sectors with an abuse of dominance investigation since 2003, 429 responses from businesses in sectors with any type of competition law investigation since 2003 and 380 responses from businesses in sectors with no competition investigations since 2003.

*Indicates statistically significant differences at a five per cent level of significance.

5.38 One or more respondents mentioned the following OFT abuse of dominance investigations:

- BskyB

- Genzyme Limited

- 5.39 The BskyB case was the best known case and was mentioned by 11 respondents.²⁷ Additional cases mentioned included investigations in the area of airlines, airports, buses and other media related investigations.
- 5.40 Although the question related to investigations undertaken by the OFT, other investigations mentioned included an investigation into the dominance of gas and water companies and the investigation that led to Gatwick Airport being sold by BAA, neither of which were undertaken by the OFT. International investigations were also mentioned such as, for example, the investigation into Michelin tyres, the Intel investigation and the investigation into Microsoft's use of Internet Explorer by the European Commission, again showing the impact of high profile international cases.
- 5.41 Again there appears to be some confusion as to what constitutes an abuse of dominance case. For example, reference was made to the commercial vehicle cartel investigation. This again implies that, while the respondents were aware of the case, they were not certain about what type of competition intervention the case was classified as.

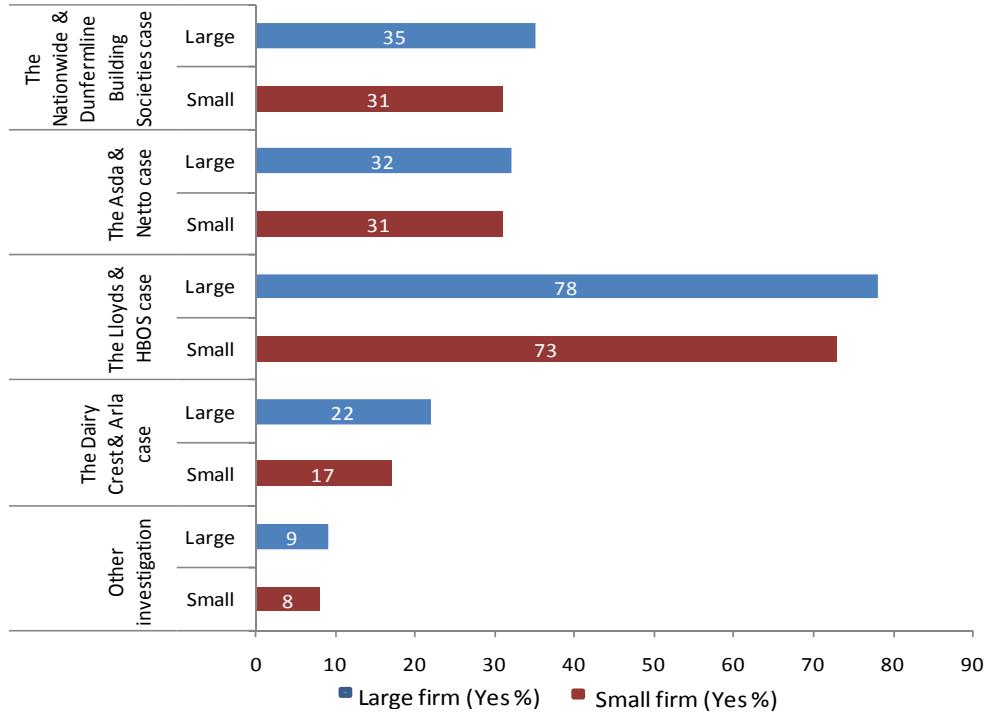
Awareness of merger investigations

- 5.42 The level of awareness of merger cases depends greatly on what case is being considered. Awareness of the Lloyds and HBOS merger case is much greater than awareness of any other case considered in the survey. In particular, 73 per cent of small business respondents and 78 per cent of large business respondents were aware of this merger case.
- 5.43 Respondents from large companies seem to be more aware about specific merger investigations respondents in small companies. However, the differences are less pronounced for merger cases than for other

²⁷ However, there may have been some confusion by respondents with the BskyB merger case 2005.

specific interventions, and for mergers, the differences are not statistically significant.

Figure 5.8: Awareness of merger investigations by firm size

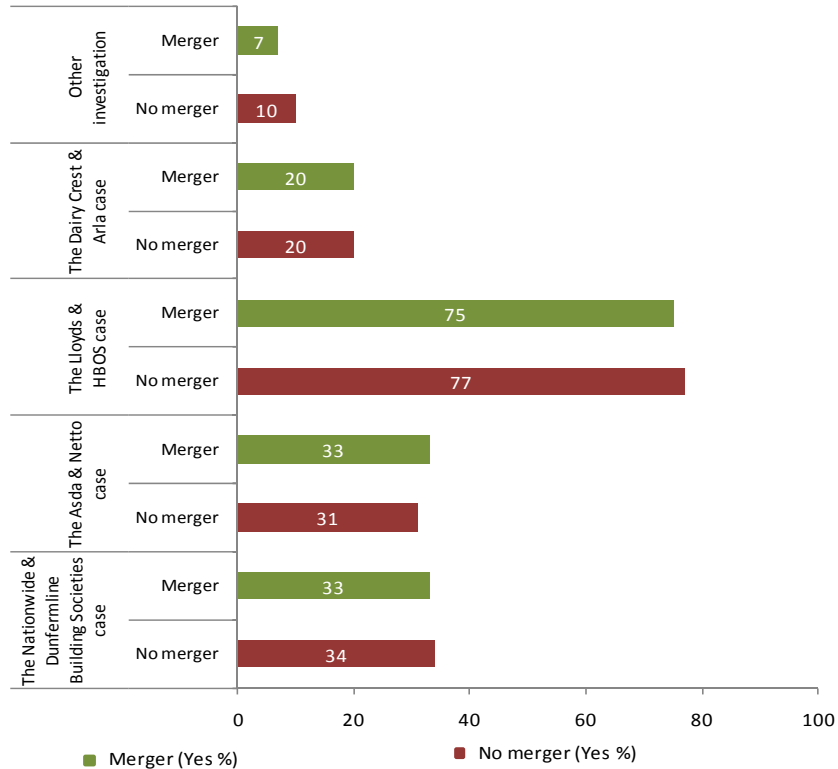


Source: Business survey. Based on 308 responses from small businesses (fewer than 200 employees) and 501 responses from large businesses (200 or more employees).

*Indicates that there is a statistically significant difference between large and small firms at the five per cent level of significance using based on one sided t-tests for unpaired samples with unequal variances.

5.44 It is generally not the case that businesses in sectors affected by merger investigations since 2003 are more aware of specific merger cases than businesses in sectors that have not been affected by a merger investigation since 2003.

Figure 5.9: Awareness of merger investigations by sector



Source: Business survey. Based on 597 responses from businesses in sectors with a merger investigation since 2003 and 212 responses from businesses in sectors with any type of competition law investigation since 2003.

*Indicates statistically significant differences at a five per cent level of significance.

- 5.45 Three other merger cases were mentioned by at least five respondents to the business survey when asked which other OFT merger investigations they knew. These were BskyB, Heinz & HP and Cadburys & Kraft.
- 5.46 Other cases mentioned included mergers between mobile phone providers, digital television providers, low-cost airlines, supermarkets and banks. However, some of these cases have been investigated by regulators such as Ofcom or considered by the European Commission.

6 SANCTIONS AND ENFORCEMENT

- 6.1 The second pillar in competition compliance is sanctions and enforcement. This pillar covers the OFT's enforcement work, and compliance in this context arises both directly as a result of competition interventions and indirectly as a result of wider deterrent effects of the OFT's competition work.
- 6.2 This chapter first discusses the deterrent effects of specific sanctions and enforcement tools available to the OFT. It then presents a summary of the evidence from a behavioural experiment on the role of sanctions and enforcement in competition compliance (full details of the experiment are presented in Annex G). Lastly, it presents survey evidence of self-reported behavioural change resulting from specific enforcement interventions.

The deterrent effect of specific sanctions and tools

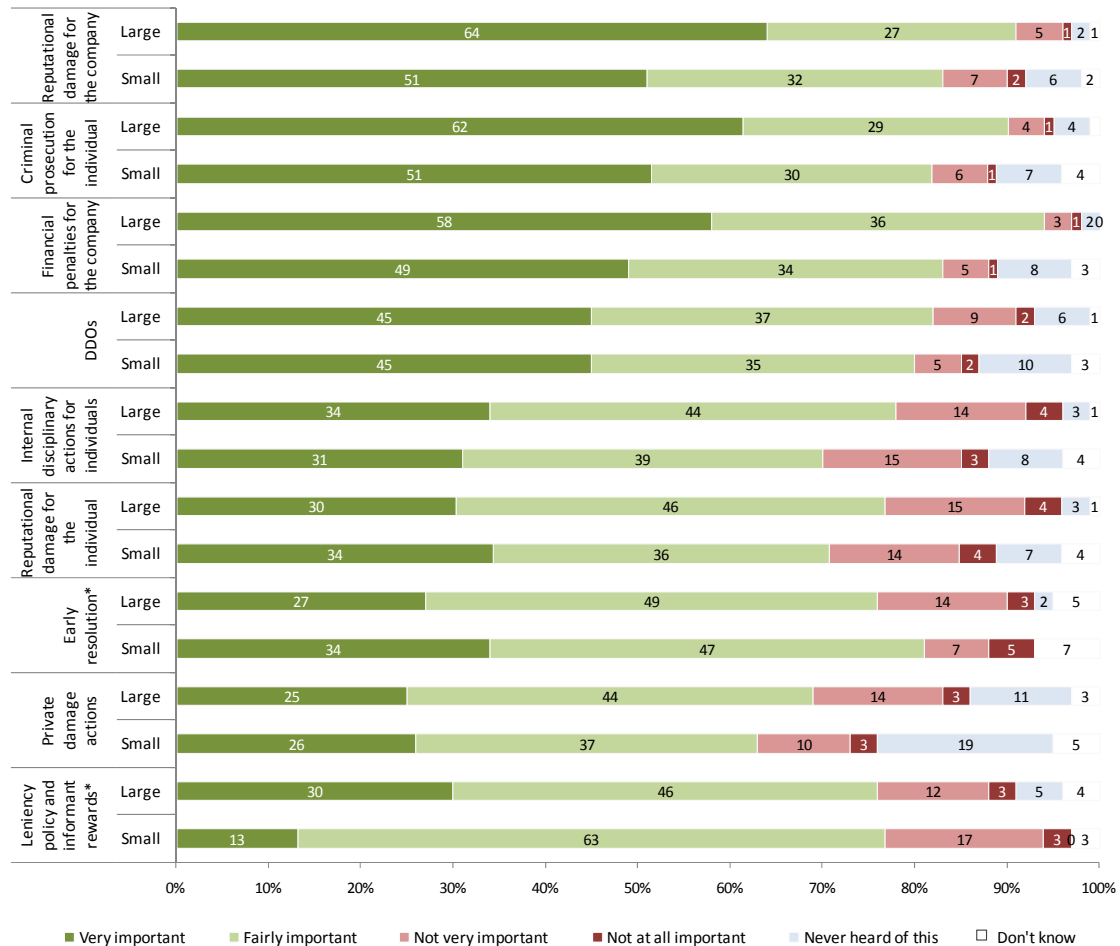
- 6.3 Deterrence may arise both from sanctions and enforcement tools used in cases where a competition infringement has been detected and from tools not necessarily linked to competition infringements (for example, the short-form opinion tool, no-grounds for action and non-infringement decisions).
- 6.4 This section considers the two types of tools separately. Deterrence from sanctions and tools available in case of infringements is analysed first, and then deterrence from other tools is considered.

Deterrence from sanctions and enforcement tools

- 6.5 The results of the business survey clearly indicate that, while other sanctions and enforcement tools also have significant deterrence effects, the three most important factors deterring potentially anti-competitive behaviour are:
- the risk of reputational damage for the company
 - criminal sanctions for individuals, and

- financial penalties for the company.

Figure 6.1: Business perceptions of the importance of different sanctions and tools in competition deterrence (percentage of respondents)



Source: Business survey. Based on 308 responses from small firms and 501 responses from large firms.

*Indicates that the question was only addressed to the sub-sample of respondents who had previously indicated that they knew what early resolution/leniency programmes are.

6.6 Reputational damage for the company appears to be the biggest deterrent for most businesses. The academic literature also suggests that reputational damage from competition enforcement is an important

deterrent for businesses (Bosch and Eckard, 1991; Gunster and van Dijk, 2011). The second most important deterrent appears to be criminal prosecution for individuals, followed by financial penalties imposed on companies.

- 6.7 Findings from the interviews with business stakeholders support the views of businesses that reputational damage and fines are very important factors in preventing anti-competitive behaviour. Business stakeholders, however, placed less emphasis on criminal prosecution. One stakeholder argued that criminal offences were not particularly effective because prosecuting a criminal offence is very difficult and requires expert skills. Another felt that criminal offences acted as a background deterrent, along with competition disqualification orders and private damages actions.
- 6.8 Although of lesser importance, all other categories are similarly seen as very or fairly important deterrents by a majority of business respondents.
- 6.9 We note that the result that director disqualification orders are found to have a lower deterrent effect than criminal sanctions is in line with the academic literature. The academic literature describes director disqualification orders as a second best compared to criminal sanctions (Wils, 2008; Stephan, 2011). As predicted by Stephan (2011) the results also provide some indication that director disqualification orders may be a relatively more effective deterrent for small companies than for large companies. While small companies, generally, are less likely to find any given enforcement tool to be a very or fairly important deterrent, there is relatively little difference between large and small companies with respect to director disqualification orders.
- 6.10 Compared to the predictions of the literature,²⁸ we note that private damages are ranked relatively low by respondents in terms of being an effective deterrent.

²⁸ For example, UK Department of Trade 2001, and Clarkin 1997.

- 6.11 It is also worth noting that leniency programmes are perceived as being a less important deterrent by many respondents. This could reflect the potentially conflicting effects of leniency programmes, that is, the programmes may destabilise the cartel, but, at the same time, imply a reduction in the average fine imposed on cartel members.
- 6.12 It is somewhat surprising that early resolution seems to be viewed as a more important deterrent than, for example, leniency programmes. This is particularly the case among small companies. The literature suggests that early settlement on its own may reduce deterrence, because the expected penalty from non-compliance may be reduced. However, if the freed up resources available to the competition authorities are diverted to more investigations and other cases, the overall deterrent effect of early settlement may increase (OECD 2008).
- 6.13 Our findings are generally in line with those of the Deloitte (2007) and the OFT (2010c) reports. Criminal penalties were perceived to be the most important sanction for companies in the Deloitte report, with director disqualification orders ranking as second. Adverse publicity was also viewed as being important by companies, which is consistent with our findings. Both lawyers and businesses viewed private damages as the least important sanction. Similarly, in the OFT study, fear of reputational damage and financial penalties for the company were considered as the most effective deterrents of non-compliance by the businesses surveyed. In addition, the study's results emphasised the relevance of individual sanctions (for example, director disqualification orders, criminal prosecution and reputational damage to the individual, and internal disciplinary sanctions) as a deterrent to non-compliant behaviour.
- 6.14 However, the Deloitte (2007) results highlighted that sanctions at the individual level are the most important. This is not completely consistent with our findings as we find that reputational damage for the company and financial penalties for the firm are ranked as two of the most important sanctions by businesses.

Differences by type of business

- 6.15 It is worth noting that, generally, a larger proportion of large companies consider each sanction/ tool to be very or fairly important deterrents and the difference between small and large companies is particularly large when it comes to financial penalties for companies.
- 6.16 Finally, we note that there are very few differences in perceptions depending on whether businesses are in sectors affected by interventions or not.
- 6.17 However, the results show that businesses in sectors affected by a cartel investigation since 2003 were somewhat **less** likely to consider criminal prosecution for the individual important. In particular, 88 per cent of respondents from sectors without a cartel investigation believe that the risk of criminal sanction is a very or fairly important deterrent. The corresponding figure for sectors with a cartel investigation was 83 per cent.²⁹

Legal professionals' perception

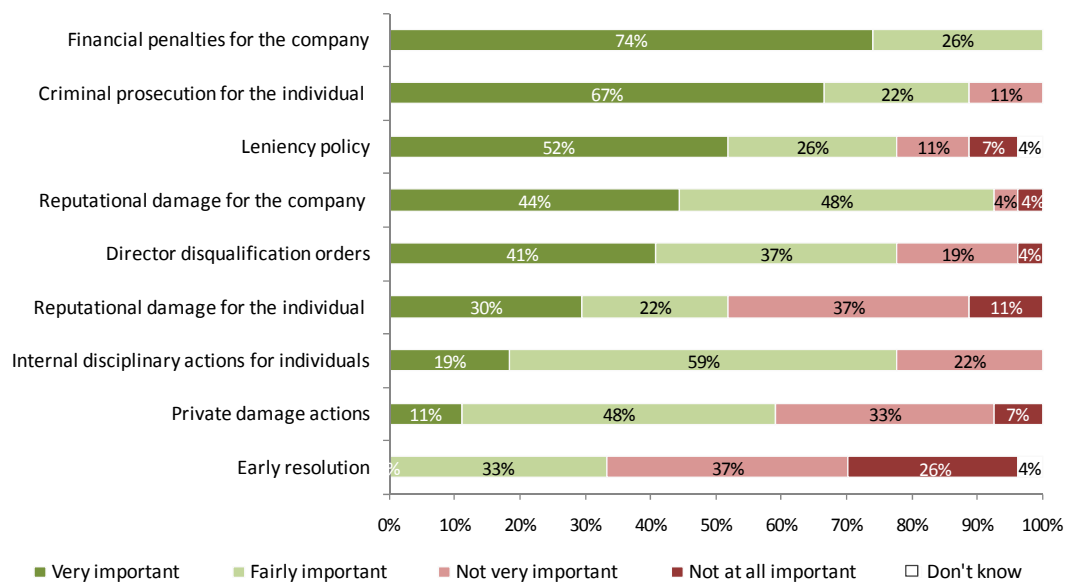
- 6.18 A comparison of the results of the business survey and the survey of legal professionals highlights some differences. Overall, the legal survey clearly ranks financial penalties to the company as the most important deterrent (Figure 6.2). Twenty out of the 27 respondents to the legal survey regarded financial penalties as very important in deterring anti-competitive behaviour and the remaining seven respondents viewed it as fairly important. These responses could reflect the fact that the legal professionals mostly advise large companies, and the discussion above suggested that financial penalties are relatively more important as a deterrent for large companies than for small companies.
- 6.19 As in the business survey, criminal prosecution and reputational damage for the company were also identified as important deterrents by the legal

²⁹ The difference is statistically significant at a five per cent level of significance.

professionals. Sixty-seven per cent of respondents (18 respondents) believed that criminal prosecution was a very important deterrent and 22 per cent (six respondents) believed that it was fairly important. One of the respondents who rated criminal prosecution as fairly important commented that it would be viewed as more important if it was 'actually used more often'. Another respondent who viewed criminal prosecution as a not very important deterrent said that this was due to the fact that 'individuals think it will never happen to them'.

6.20 Compared to fines and criminal sanctions, a smaller proportion of legal professionals viewed reputational damage for the company as a very important deterrent. However taken together, 92 per cent of the respondents viewed reputational damage to the company as either very or fairly important deterrent.

Figure 6.2: Legal professionals' perceptions of the importance of different sanctions and tools in competition deterrence (percentage of respondents)



Source: Legal survey. Based on 27 responses.

- 6.21 Compared to businesses, legal professionals ranked leniency policy as a much more important deterrent. More than half of the respondents to the legal survey believed that this was a very important deterrent. In the business survey, only 30 per cent of large firms rated it as very important and the percentage was even lower for small firms.
- 6.22 The majority of legal professionals also said that director disqualification orders, reputational damage for the individual, private actions and internal disciplinary actions for individuals are very or fairly important deterrents. However, two points should be noted:
- Two respondents commented that if DDOs were actually used more often in practice, then they would be an important tool in deterring anti-competitive behaviour.
 - Legal professionals generally viewed reputational damage to the individual as a much less important deterrent than businesses did.³⁰
- 6.23 Early resolution is viewed as least important in deterring anti-competitive behaviour by legal professionals and, on average, as much less important than by businesses.
- 6.24 The findings of the legal survey are consistent with those reported in the Deloitte (2007) report. They also found that criminal penalties and fines were viewed as the two most important sanctions by legal advisors.

The role of reputational damage

- 6.25 Both the legal survey and the business survey identified reputational damage for the company as an important deterrent. Both surveys also suggested that reputational damage for the individual is less important as a deterrent. This may be because there is less 'naming and shaming' of individuals than of companies.

³⁰ Sixty-four per cent of large companies and 51 per cent of small companies considered reputational damage to be very important, this compares to 44 per cent of legal professionals.

- 6.26 Interviews with business stakeholders also suggested that reputational damage is highly important. Among the business stakeholders, there were mixed views on whether the outcome of an investigation was important for deterrence. One respondent felt that the publicity surrounding a case was more important than the end result, while another argued that cases that did not result in conviction could hamper compliance.
- 6.27 Most frequently, respondents to both the business survey and the legal survey believed that reputational damage from the investigation and the decision were equally important in terms of deterring anti-competitive behaviour (Table 6.1 and Table 6.2).

Table 6.1: Business survey: Is the reputational damage from the investigation or from the decision? (percentage of respondents)

	Reputational damage for company		Reputational damage for individual	
	Small	Large	Small	Large
From the investigation (%)	26	24	25	23
From the decision (%)	30	27	29	31
From both (%)	41*	49*	43	45
Don't know (%)	3*	1*	2	1
Total (%)	100	100	100	100
Total number of respondents	256	456	217	384

Source: Business survey. Only asked to respondents who indicated that reputational damage is very or fairly important deterrent. *indicates statistically significant differences between the two size groups at a five per cent level of significance.

Table 6.2: Legal survey: Is the reputational damage from the investigation or from the decision? (percentage of respondents)

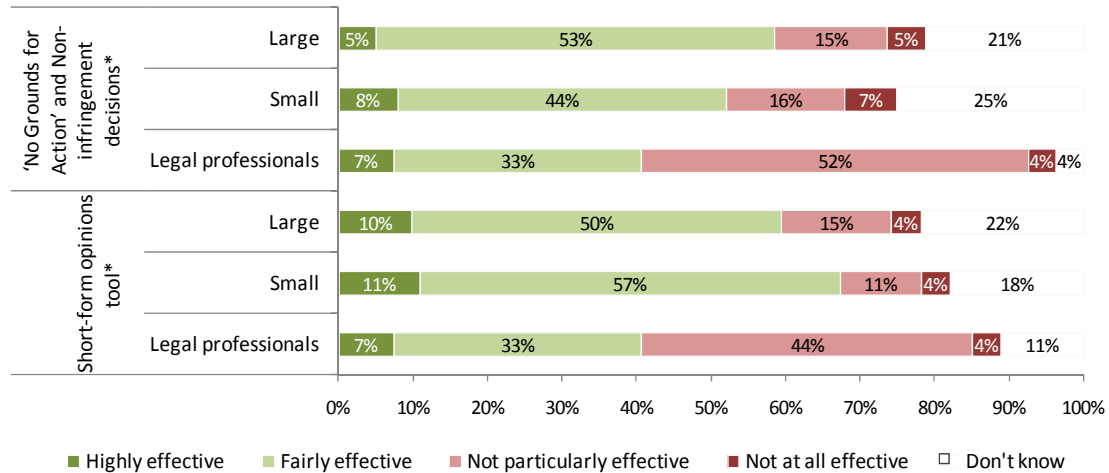
	Reputational damage for company or individual
From the investigation (%)	4%
From the decision (%)	20%
From both (%)	76%
Total (%)	100%
Total number of respondents	25

Source: Survey of legal professionals. Only asked to respondents who indicated that reputational damage is very or fairly important deterrent.

Deterrence from other tools

- 6.28 Opinions are divided as to whether the short-form opinion tool, no-grounds for action and non-infringement decisions are effective deterrents of anti-competitive behaviour.
- 6.29 Slightly more than half of large and small business respondents, who know what 'No grounds for Action' and 'Non-infringement' decisions are, believe that they highly or fairly effective. However, most legal professionals did not agree with this assessment. Some legal professionals argued that 'No grounds for action' and 'Non-infringement' decisions had not been used enough to allow for an assessment of the effectiveness. Other legal professionals commented that these are not preventive measures because they only apply at the end of an investigation.
- 6.30 The survey results, similarly, show that, while the majority of small and large business respondents, who know what short-form opinions are, view them as either fairly or highly effective deterrents, less than half of legal professionals think that this is the case. Several legal professionals mentioned that the short-form opinion has not been in use long enough to fairly judge its effectiveness but that, in theory, it should be an effective tool.
- 6.31 Business stakeholders interviewed were generally supportive of short-form opinions, but noted that businesses would prefer that their responses remained confidential.

Figure 6.3: Effectiveness of short form opinions and no grounds for action/non-infringement decisions in deterring anti-competitive behaviour (per centage of respondents)



Source: Business survey and legal survey. Based on 27 (27) responses to the legal survey, 61 (28) small business responses and 159 (82) responses for 'no grounds for action'/non-infringement decisions (short form opinions).

Sanctions as drivers of compliance: evidence from a behavioural experiment

- 6.32 In order to better understand drivers of compliance, a behavioural experiment with business representatives was undertaken. The experiment was an online experiment with 93 competition compliance officers that completed the business survey and agreed to participate in a six minute follow-up experiment.
- 6.33 The experiment tested whether and in what circumstances participants would be willing to engage in a cartel. In particular, the experiment observed compliance officers' behaviour when they were (i) faced with different fine levels (including doubling the fine); (ii) different probabilities of detection/incurred a fine; and (iii) their decision resulted in third-party consumer harm.

6.34 Full details of the behavioural experiment are included in Annex G. We summarise the main design features and findings from the behavioural experiment in this section.

6.35 In the experiment, participants were faced with a choice between two options, namely Option 1 and Option 2 as shown below.

Table 6.3: Options faced by participants

Option 1	It is guaranteed	You receive	£120
		Other participant receives	£160
Option 2	Probability (1-p)	You receive	£120 + Bonus
		Other participant receives	£160 – Loss
	Probability (p)	You receive	£120 – Fee
		Other participant receives	£160

6.36 In Option 1 participants receive £120 with certainty and the other participant (the consumer) receives £160.

6.37 In Option 2 participants do not know with certainty how much they will earn. With probability (1-p) they will receive a pay-off of £120 plus a bonus, whilst the other player receives £160 minus a loss. However, with probability p the participant will receive a pay-off of £120 minus a fee, whilst the other player receives £160.³¹

6.38 Option 2 represents the participant engaging in cartel activity, with the probability p being the probability of detection, 'fee' being the fine imposed, 'bonus' representing the potential increase in profit from cartel participation and 'loss' representing the consumer detriment caused by

³¹ The value of p varied between 1/3 and 2/3.

the cartel. In Option 2 there are two possible outcomes depending on whether the cartel is detected or not.

6.39 The values of the bonus, fee, loss and probability of being caught were varied during the experiment in nine different tasks (the tasks are detailed in Annex H). The magnitude of the fee varied between £30 and £120, the loss between £40 and £80 and the bonus was £60.

6.40 Participants were then given the choice, for each task they faced,³² between three alternatives:

- Always choosing option 1 (not participating in the cartel).
- Always choosing option 2 (participating in the cartel).
- Choosing option 2 if the bonus (fee) was higher (lower) than some level specified by the respondent.

6.41 The main observations from the experiment were the following:

- The majority of participants selected 'always option 1' in each of the nine tasks. Option 1 is the non-risky option and illustrates that the majority of participants would choose not to engage in cartel activity.
- The next most likely choice made by participants was option 2 depending on the fee or bonus. This indicates that participants' decision to engage in anti-competitive behaviour is influenced by the magnitude of the possible fine and pay-off.
- A small proportion of participants chose 'always option 2'. This group of participants can be viewed as risk loving. This suggests that there may be some businesses that would always be willing to participate in a cartel regardless of what sanctions are put in place.

³² Each participant undertook three out of the nine tasks. The allocation of participants to tasks is shown in Annex G.

Hence some non-compliance may be explained by risk loving attitudes (Figure G.1).

- The observations from the experiment also suggest that, while financial incentives are the most important for compliance and non-compliance, social concerns are also drivers of compliance.
- Interestingly, we observe that participants' with a higher level of knowledge about competition law are more likely than those who are not knowledgeable to choose option 2, and are more likely to choose option 2 irrespective of the fee or bonus. This suggests that knowledge may not always be a driver of compliance. Instead a high level of knowledge may be a sign of potential non-compliance (Table G.7).

6.42 Overall, the experiment shows that participants are most likely not to engage in cartel behaviour. However, there exist a small proportion of individuals who are risk loving, and the biggest challenge for competition authorities is to deter this group of people.

Deterrent effect of specific enforcement interventions

6.43 This section considers the deterrent effect of specific interventions undertaken by the OFT. By setting an example and potentially increasing businesses' perceived probability of being punished, specific interventions may cause competition compliance. The section considers evidence provided by both businesses and legal professionals.

6.44 The survey specifically asked businesses if they had changed their behaviour due to a specific competition intervention.

6.45 Generally, the survey results suggest that very few behavioural changes occurred as a direct result of specific interventions. It should be emphasised that this does not imply that the UK competition regime as a whole may not have a large deterrent effect.

Impacts of cartel interventions

- 6.46 Specific cartel cases seem to be the competition intervention with the greatest impact on behaviour. A total of six small companies and 12 large companies in our sample have changed behaviour because of a **specific** cartel intervention. This compares to two small companies and 23 large companies that reported changing behaviour as a result of the **risk** of an OFT cartel investigation more generally.
- 6.47 It is worth noting that the replica football kit case has led to more cases of behavioural change than any other case considered in the survey. Businesses also reported the greatest awareness of this case (62 per cent of large business and 49 per cent of small businesses, section 5.22). At the same time, it was one of the first so-called hub-and-spoke cartel cases. However, we note that these results must be interpreted with caution because so few companies indicated that they have changed behaviour.
- 6.48 Four companies in the sample changed behaviour as a result of the loan pricing case and another four because of the case involving double glazing suppliers. After the replica football kit, the loan pricing case was the case businesses were second most aware of (52 per cent of large and 50 per cent of small businesses).

Table 6.4: Behavioural impact of specific cartel cases by firm size

Case	Small	Large
Price fixing of replica football kits	3	3
The loan pricing case involving the Royal Bank of Scotland and Barclays	2	2
Price fixing by Double Glazing Suppliers	1	3
Other: Airline passenger fuel surcharges for long-haul passenger flights	0	2
Other: Dairy / Supermarkets	0	1
Other: Bid rigging in the construction industry in England	0	1

Total	6	12
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Source: Business survey. Number of firms that have changed behaviour.

- 6.49 Other cases mentioned by respondents as having impacted their behaviour were the OFT investigation into airline passenger fuel surcharges, the OFT investigation into bid-rigging in the construction industry and an OFT investigation into potentially anti-competitive agreements between dairy producers and supermarkets.
- 6.50 Ten out of the 12 companies that have changed behaviour as a result of a specific cartel case are in different sectors than the one directly affected by the investigation. This implies that specific deterrent effects may not be limited to particular sectors.
- 6.51 Legal professionals mentioned the cases in Table 6.5 as cartel cases that had affected client behaviour. Most commonly, legal professionals referred to the construction industry bid-rigging case. Legal professionals also believed that the private motor insurance case and the replica football kit price-fixing case had had behavioural impacts.³³

Table 6.5: Cartel cases which had a behavioural impact

Case	Frequency
Bid rigging in the construction industry in England	8
Private motor insurance sector	4
Replica football kit price-fixing	3
Loan Pricing Case (RBS, Barclays)	3
Schools: exchange of information on future fees	2
Tobacco	2
Airline passenger fuel surcharges for long-haul passenger flights	2

³³ Surprisingly, the results also suggest that, like businesses, legal professionals had difficulty differentiating between the different types of anti-competitive behaviour. Among the cases listed in the table above, the acquisition of Fairway Group by the Co-operative Group is a merger, the Tobacco case is a commercial agreement and the Associated Newspapers Limited case is an abuse of dominance case. The Marine Hose cartel case was also mentioned even though this ruling was an EC ruling. However, the OFT did also have a role in the investigation.

(BA/Virgin)	
Hasbro UK Limited/Argos Limited/Littlewoods Limited	2
Co-operative Group (CWS) Limited/Fairways Group UK Limited	1
(Pre-2003) Leeds cartel case	1
Associated Newspapers Limited	1
Marine Hose	1
Groceries information sharing (case dropped)	1

Source: Legal survey.

Impacts of investigations into other anti-competitive agreements

- 6.52 In the survey, six large companies and one small company indicated having changed behaviour as a result of specific cases involving anti-competitive agreements. This compares to two small companies and 18 large companies that reported changing behaviour as a result of the risk of an OFT investigation more generally.
- 6.53 In particular, the case of centralised credit hire fees involving the Association of British Insurers and the case of price coordination in the UK grocery sector appear to have had the greatest behavioural impact.
- 6.54 The reported change in behaviour is in line with reported business awareness (section 5.28). Thirty-seven per cent of large businesses and 28 per cent of small businesses were aware of the price-coordination case in the UK grocery sector. Twenty-three per cent and 19 per cent of large and small businesses, respectively, were aware of the centralised credit hire fees case.³⁴
- 6.55 The companies in the sample who have changed their behaviour as a result of the case of centralised credit hire fees are in the sectors 'warehousing and support activities' and 'activities auxiliary to financial'.

³⁴ Awareness of the agreement of credit card fallback transaction fees involving the Master Card UK Members Forum was higher than the case of centralised credit hire fees, 37 per cent of large and 31 per cent of small businesses were aware of the Master Card case.

The latter company may have been directly affected by the OFT intervention. The companies that changed behaviour as a result of the UK grocery sector case are both in unrelated sectors.

- 6.56 Two large firms and one small firm indicated that they had modified their behaviour as a result of other OFT investigations into anti-competitive agreements.

Table 6.6: Behavioural impact of specific cases involving anti-competitive agreements by firm size

Case	Small	Large
Centralised credit hire fees involving the Association of British Insurers	0	2
Price co-ordination involving the UK Grocery sector	0	2
Other: BskyB	1	
Other: Airline passenger fuel surcharges for long-haul passenger flights	0	1
Other: Investigation into commercial vehicle manufacturers	0	1
Total	1	6

Source: Business survey. Number of firms that have changed behaviour.

- 6.57 Legal professionals most commonly said that the Tobacco case and the replica football kit price-fixing case had an impact on their clients' behaviour.

Table 6.7: Anti-competitive agreement cases which had a behavioural impact

Case	Frequency
Tobacco	2
Replica football kit price-fixing	2
Hasbro UK Limited/Argos Limited/Littlewoods Limited	2
Hotel online booking sector	2
Dairy/Supermarkets	1
Foxtons Estate Agents	1
Lladró Commercial S.A – bilateral price-fixing agreement	1

Private motor insurance sector	1
Loan Pricing Case (RBS, Barclays)	1
Sale of e-books	1

Source: Legal survey.

6.58 However, some of the cases mentioned by legal professionals were not anti-competitive agreement cases. For example, the Foxtons Estate Agents case was a consumer enforcement case. This further emphasises the difficulty that even legal professionals appear to have when differentiating between different types of anti-competitive investigations.

Impacts of abuse of dominance cases

6.59 When asked if a specific intervention had made their company change behaviour, one large company reports to have changed its behaviour as a result of the Gaviscon case and one small company reports to have changed behaviour as a result of the BskyB case. No small companies and nine large companies reported changing behaviour as a result of the *risk* of an OFT abuse of dominance investigation more generally.³⁵

6.60 The Gaviscon case was the case with the second highest level of awareness reported by large businesses (section 5.35). It is worth noting that the company reporting having changed its behaviour as a result of the Gaviscon case is a manufacturer of basic pharmaceuticals.³⁶

6.61 Most commonly, legal professionals mentioned the Napp Pharmaceuticals case from 2001 as an important case that had directly impacted client behaviour.

6.62 Of those cases mentioned by legal professionals only the following were abuse of dominance cases carried out by the OFT Napp Pharmaceuticals; Harwood Park Crematorium, BetterCare Group/North & West Belfast Health and Social Services Trust, Genzyme Limited, and Gaviscon. .

³⁵ Note.

³⁶ SIC 21.10.

6.63 Of the other cases mentioned, they were either not abuse of dominance cases or were not carried out by the OFT. An example is the English Welsh and Scottish Railway case which was carried out by the Office of Rail regulation (ORR).

Table 6.8: Abuse of dominance cases which had a behavioural impact

Case	Frequency
Napp Pharmaceuticals	3
DC Thomson & Co Limited / Aberdeen Journals Limited	2
Harwood Park Crematorium	1
BetterCare Group Limited/North & West Belfast Health and Social Services Trust	1
English Welsh and Scottish Railway Limited	1
Tobacco investigation	1
Hasbro UK Limited / Argos Limited/ Littlewoods Limited	1
TAP Pharmaceuticals	1
Genzyme Limited	1
Gaviscon	1

Source: Legal survey.

Impact of merger cases

6.64 One small and one large company in the sample reported to have abandoned or modified a merger on competition grounds because of a merger investigation, and one large company in the sample has been encouraged to pursue a merger because of the Asda and Netto merger case.

6.65 It is worth noting that the company that reported having pursued a merger because of the Asda and Netto merger is in the related 'wholesale of food, beverages and tobacco' sector.³⁷

³⁷ SIC 46.31.

- 6.66 The legal advisors only mentioned two specific merger cases which they believed led clients to abandon or modify a proposed merger. These were IBA Health Limited/iSOFT Group plc and SvitzerWijismuller A/S/Adsteam Marine Limited.
- 6.67 Legal professionals also more generally referred to a grocery retailing case, a funeral case and a Sky minority investment investigation which they also felt had lead to a change in their clients' behaviour.

Table 6.9: Merger cases which had a behavioural impact

Case	Frequency
IBA Health Limited/iSOFT Group plc	1
SvitzerWijismuller A/S/Adsteam Marine Limited	1

Source: Legal survey.

Within and across sector effects

- 6.68 Because of the low incidence of behavioural change reported in response to specific cases in the business survey, it is not feasible to credibly assess whether behavioural change is greater in sectors directly affected by a specific intervention than in other sectors.
- 6.69 However, the survey of legal professionals provides some evidence in this respect. When asked whether the deterrent effect of decisions and investigations by UK competition authorities is greater in sectors directly affected by the intervention than in unrelated sectors, all legal experts said the effect was greater in the sector directly affected. In particular, 78 per cent said that it had a much greater effect in the sector directly affected by the investigation or decision and 22 per cent said that it had a somewhat greater effect.
- 6.70 The previous analyses presented in Chapter 5 of the awareness of specific interventions by sector provide some indirect evidence regarding the relative size of within and across sector deterrent effects. The business survey results do not suggest that businesses in sectors that have been affected by a cartel or merger investigation since 2003 are more aware of these investigations than businesses in other sectors.

However, firms in sectors which have been affected by abuse of dominance investigations tend to be slightly more aware of specific cases of this type than firms from other sectors. Finally, for anti-competitive agreements, businesses from sectors in which commercial investigations have taken place often seem to be more aware of this type of case than businesses in sectors with no OFT investigation since 2003. These findings are also supported by our later observation (section 7.18), that businesses in sectors directly affected by OFT interventions are more likely to use information sources to inform them about competition policy, than those in unaffected sectors.

7 VOLUNTARY COMPLIANCE MEASURES

- 7.1 The third pillar of competition compliance consists of voluntary compliance measures.
- 7.2 This chapter analyses the use of compliance measures by companies, and reviews the information sources used to inform these measures. The chapter also discusses what types of compliance measures legal professionals recommend and the usefulness of OFT guidance to legal professionals.

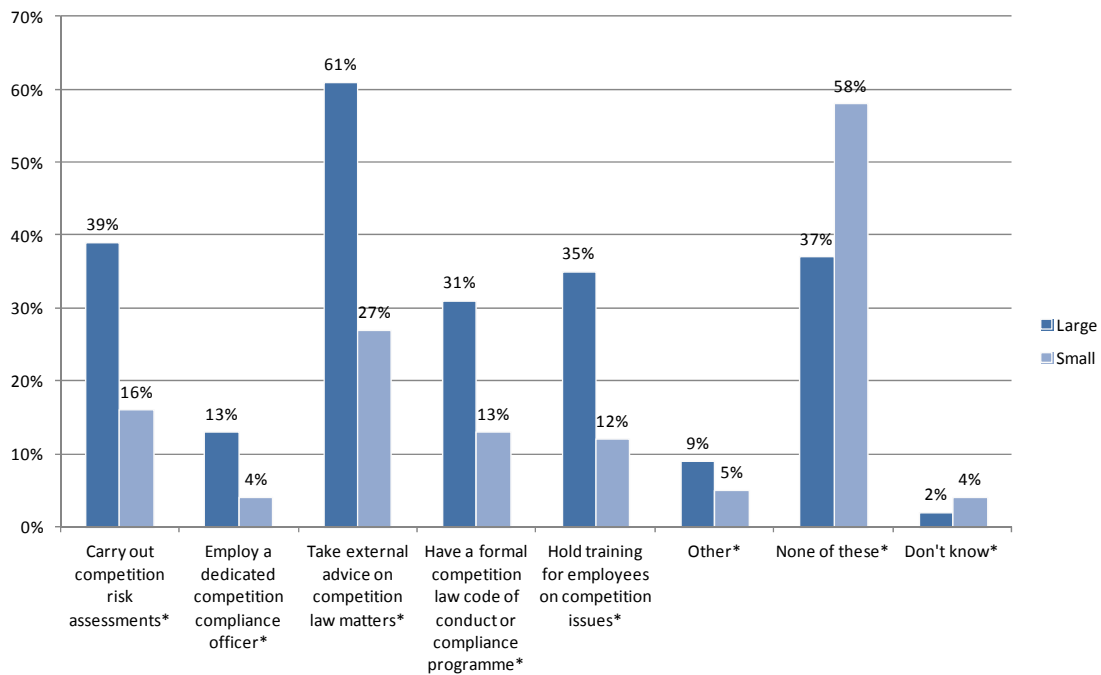
Compliance measures used by businesses

- 7.3 Business stakeholders consulted as part of this study argued that competition compliance typically is considered by managers very close to the top of a firm, with active involvement of senior management. Acquisition and merger discussions normally go straight to the top so that senior management are involved immediately, but specific approaches vary and depend on the style of management within the firm.
- 7.4 Business stakeholders also suggested that large companies tend to have structured compliance programs, which also cover competition law. This is to ensure that all relevant information (for example, all contacts with competitors) is collected in a central point.
- 7.5 Smaller companies' compliance measures are typically more ad hoc and often do not have compliance officers. This means that when they face many other compliance issues (for example, occupational health and safety), compliance with competition law may be put on the back burner. However, one business stakeholder believed that smaller firms are still likely to have the relevant OFT guidance available on their premises.
- 7.6 These views are largely consistent with the results of the business survey. There is a clear tendency that large firms have significantly more formal compliance measures in place than small companies, and large

companies are also more likely employ a dedicated competition compliance officer.

7.7 External advice is the most common measure taken to ensure compliance by both large and small companies. This result is also consistent with the findings of Deloitte (2007) which found that the most common compliance measure was taking external legal advice.

Figure 7.1: Compliance measures used by businesses by firm size



Source: Business survey. Based on 308 responses for small companies and 501 responses for large companies.

*Indicates statistically significant differences between the two size groups at a five per cent level of significance.

7.8 The second most common measure used by business to ensure compliance is competition risk assessments. Business stakeholders consulted as part of the study also indicated that competition risk assessments are undertaken for particular projects but with varying degrees of formality. In this context, companies will generally seek legal advice.

- 7.9 Furthermore, about a third of large companies hold training for employees on competition issues and about the same proportion of large companies have a formal competition law code of conduct or compliance programme. The corresponding figures for small companies are 12 per cent and 13 per cent, respectively.
- 7.10 Overall, 58 per cent of small companies and 37 per cent of large companies have no compliance measures in place.
- 7.11 Further sectoral analysis of the results suggests that a higher percentage of firms from sectors, which have been subject to competition law intervention since 2003, take external advice on competition matters and have a formal competition law code of conduct or compliance programme.³⁸ They are also more likely to hold training programmes for employees on competition issues.
- 7.12 Similar conclusions hold when comparing companies from sectors which have experienced a merger investigation since 2003 and those from sectors which have not. A higher percentage of firms from sectors which have experienced such investigations since 2003 have some form of compliance measure in place.

Use of external information to inform competition compliance

- 7.13 The majority of UK businesses have never used external information to inform their competition compliance measures. However, businesses in sectors affected by OFT interventions are more likely to use external information to inform their competition compliance. For example, 43 per cent of businesses in sectors affected by competition law investigations since 2003 use information sources to inform competition policy. The

³⁸ This is statistically significant at the five per cent level.

comparable figure in sectors with no competition law interventions since 2003 is 36 per cent.³⁹

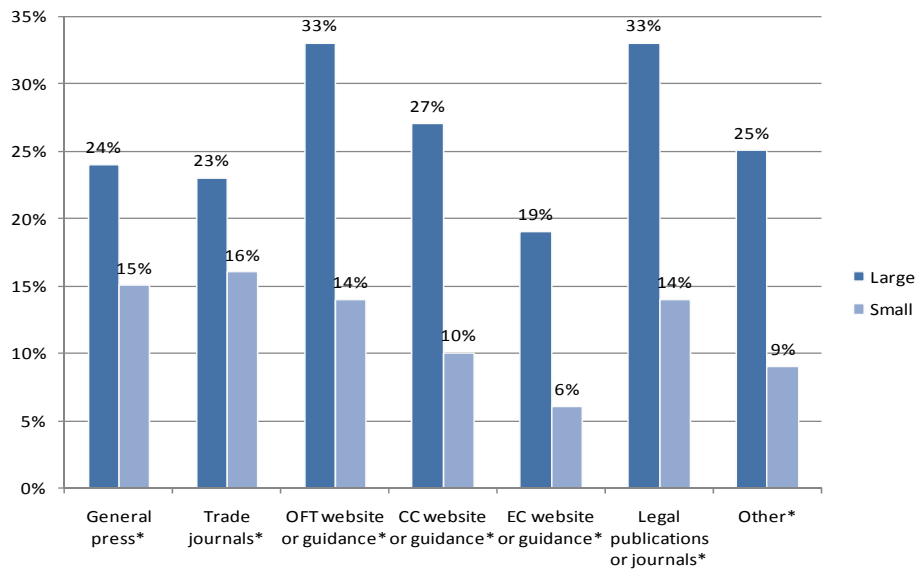
- 7.14 A similar pattern is observed when the sample is split according to whether there has been a merger investigation in the sector since 2003. However, in this case the difference is small and not statistically significant.

Information sources used

- 7.15 Small companies use fewer information sources than large companies and there are some notable differences in the relative importance of the different information sources for large and small companies (Figure 7.2).
- 7.16 Small companies are relatively more likely to refer to information in trade journals and the general press to inform their competition compliance. In fact, these are the two most commonly used sources for small companies.
- 7.17 In comparison, large companies are most likely to refer to the OFT website and guidance, and legal publications or journals. One in three large companies has used these information sources to inform their compliance measures. Large companies are also much more likely than small companies to have referred to CC or EC DG Competition websites and guidance.

³⁹ The difference between large and small companies is statistically significant at the five per cent level of significance.

Figure 7.2: Information sources used to inform competition policy by firm size (per cent of respondents)

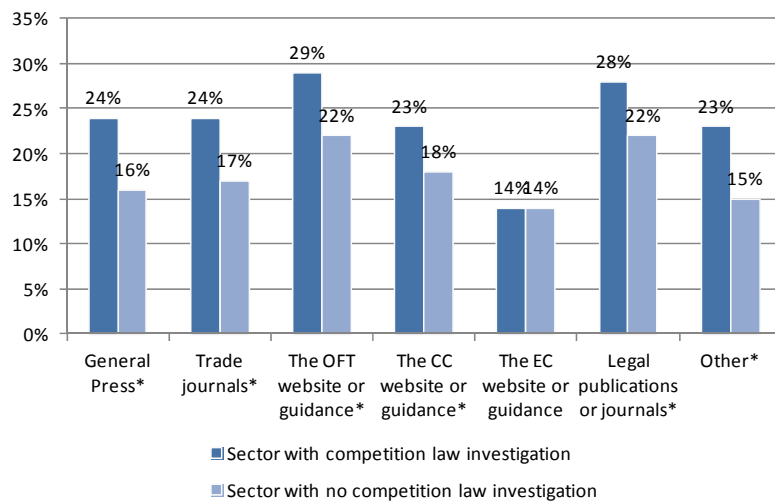


Source: Business survey. Based on 308 responses for small firms and 501 responses for large firms.

*Indicates statistically significant differences between the two size groups at a five per cent level of significance.

7.18 Further analysis by sector shows that businesses in sectors directly affected by OFT competition interventions are more likely to use all of the sources mentioned in Figure 7.2 above with the exception of EC guidance where there is no apparent difference. This suggests that OFT intervention may raise awareness of competition issues and prompts businesses to search more intensively for information.

Figure 7.3: Information sources used to inform competition policy by whether there had been a competition law investigation in the sector



Source: Business survey. Based on 377 responses in sectors with no intervention and 432 responses in sectors with an intervention.

*Indicates statistically significant differences between the two size groups at a five per cent level of significance.

7.19 A similar but much less pronounced pattern emerges if businesses in sectors with a merger investigation since 2003 are compared to businesses in sectors with no merger investigation over the period. Businesses in sectors with merger investigations are more likely to use general press and trade journals to inform their competition compliance. There are no other statistically significant differences between businesses in sectors with and without mergers in this respect.

Compliance measures recommended by legal professionals

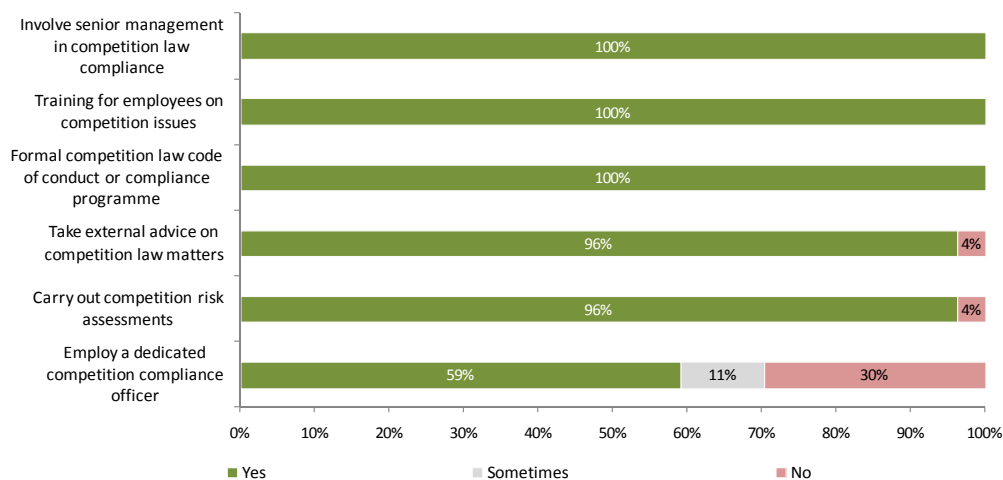
7.20 Given that external advice is the most important type of compliance measure used by businesses, business behaviour is likely to be highly influenced by the advice provided. In particular, businesses choice of compliance measures may be affected by the recommendations of legal professionals.

7.21 The results of the legal survey suggest that legal professionals have advised clients to implement many different types of compliance measures. All legal professionals surveyed for this study had recommended to one or more clients to:

- involve senior management in competition law compliance
- train employees on competition issues, and
- have a formal competition law code of conduct or compliance programme.

7.22 Two respondents explicitly mentioned that they believed that the single most important issue was ensuring that senior management be involved in the competition compliance policy.

Figure 7.4: Measures recommended by legal professionals to ensure a competition compliance culture



Source: Legal survey. Based on 27 responses.

7.23 Legal professionals were least likely to have advised clients to employ a dedicated competition compliance officer. Eight legal professionals had not advised clients to do so and three said that they had sometimes

advised their clients to do so depending on the size of the company and their resources.

7.24 Sixteen respondents to the legal survey (equivalent to 59 per cent of the sample) indicated that they had also advised clients to implement other compliance measures. Most frequently, this advice involved setting up a whistle-blower hotline or implementing regular audits and reviews of compliance.

7.25 Clients were also sometimes advised to set up internal disciplinary sanctions for breaches of competition law and to carry out spot checks of compliance within the company.

Table 7.1: Other measures recommended by legal professionals to ensure a competition compliance culture

	Frequency
Whistle-blower helpline	4
Regular audits/reviews of compliance	4
Internal sanctions for breaches of competition compliance	3
Online training	2
Spot checks within the company (for example, audits)	2
Ensure someone is responsible for competition compliance	1
Monthly reporting of sensitive issues (for example, meetings of competitors)	1
'Mystery shop' of company minutes	1
Carefully document decisions to have contemporaneous notes	1
Regular compliance bulletins for employees to keep compliance on their radar	1

Source: Legal survey. Based on 16 responses from respondents who had advised clients to implement other compliance measures

Usefulness of OFT guidance to legal professionals

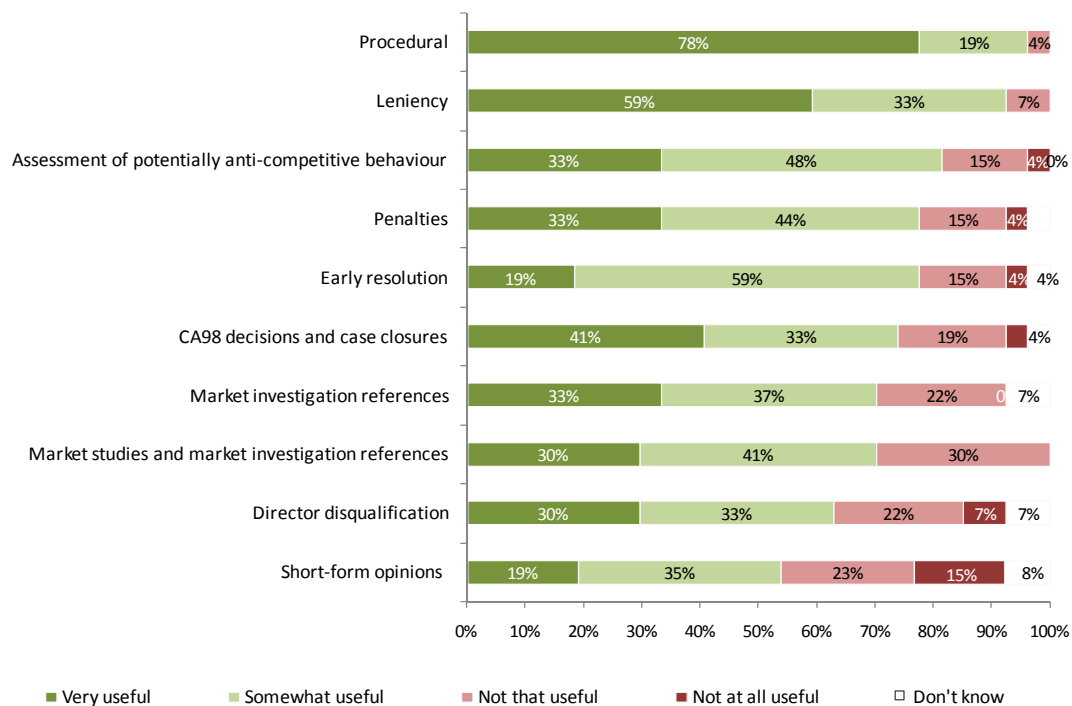
7.26 Advice provided by legal professionals to businesses may be informed by OFT guidance. The survey of legal professionals suggests that legal professionals generally find OFT tools and guidance useful (Figure 7.5).

Guidance relating to competition law

7.27 Regarding competition law, procedural guidance was generally viewed as most helpful by respondents with just one legal professional finding it not that useful and 78 per cent finding the guidance very useful.

7.28 Similarly, the OFT's leniency guidance was viewed very positively, with only two legal professionals finding the guidance not that useful and 59 per cent of the respondents finding it very useful.

Figure 7.5: Usefulness of OFT guidance relating to competition law to legal professionals



Source: Legal survey. Based on 27 survey responses. However, one missing response for short form opinion. Note: In some instances, such as early resolution, there is no official written guidance issued by the OFT. This implies that guidance may be interpreted more broadly than a specific OFT guidance document by respondents.

7.29 The OFT's guidance on the assessment of potentially anti-competitive behaviour was viewed also generally very positively. Just one advisor

felt it was 'not at all useful' and four found it 'not that useful'. One of these survey respondents commented that this was due to the fact that there was 'too much overlap with EC guidance' which was generally viewed first.

- 7.30 Although still viewed as very or somewhat useful by a majority of respondents, director disqualification guidance and short-form opinions were generally found to be less useful than other types of guidance related to competition law. One respondent commented that this was because the guidance is not put into practice and, if it had been, the guidance would have been classified as very useful.
- 7.31 Similarly, 10 respondents (38 per cent) found short-form opinions not that useful or not at all useful.⁴⁰ These results are likely to be related to the fact that short-form opinions is a relatively new tool used by the OFT and, so far, only one short-form opinion has been published.

Merger tools and guidance

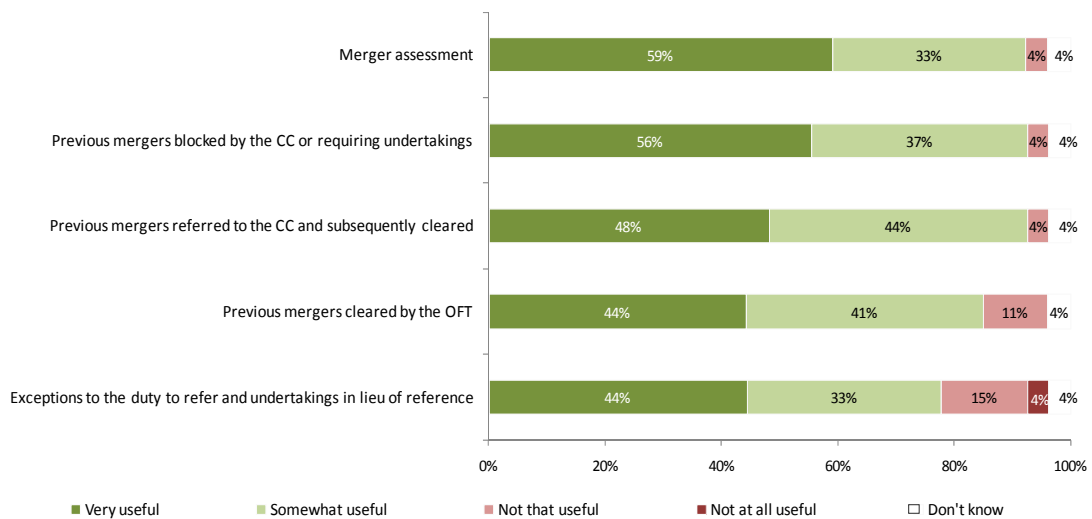
- 7.32 Merger tools and guidance were also generally found to be useful by legal professionals surveyed for this study.
- 7.33 Ninety-three per cent of respondents to the survey viewed the OFT's merger assessment guidelines as very or somewhat useful. The same percentage of survey respondents viewed information on a) previous mergers blocked by the CC or requiring undertakings, and b) information on previous mergers referred to the CC and subsequently cleared as very or somewhat useful.
- 7.34 Although the OFT's merger assessment guidelines appear to be the most useful information for legal professionals, one of the legal professionals who found merger assessments 'somewhat useful' commented that the

⁴⁰ One respondent did not provide an answer to the question about the usefulness of short-form opinions. So, the total number of responses for this sub-question was 26.

degree of predictability has decreased in recent years because the whole approach has become increasingly complex.

7.35 Overall, the OFT's exceptions to the duty to refer and undertakings in lieu of reference appear to be the least useful merger tools and guidance for legal professionals. However, the majority of the legal advisors surveyed found this tool either very or somewhat useful.

Figure 7.5: Usefulness of OFT merger tools and guidance to legal professionals



Source: Legal survey. Based on 27 survey responses. One respondent who had not worked with mergers in the past five years gave the answer 'don't know' to all parts of the question on merger tools and guidance.

8 DETERRENT EFFECT OF THE UK COMPETITION REGIME

- 8.1 This chapter analyses the overall deterrent effect of the UK competition regime by calculating deterrence ratios based on reported behavioural changes attributed to the risk of competition investigations. This is done separately for different types of interventions. The chapter first estimates the deterrent effect of competition law interventions that is, abuse of dominance cases, cartel cases, and investigations into other anti-competitive agreements.
- 8.2 Due to the inherent differences between mergers and other types of potentially anti-competitive behaviour, the analysis of mergers is undertaken separately.
- 8.3 The discussion also covers potential over-deterrence of competition law investigations.
- 8.4 Where appropriate, the results of the current study are also discussed in relation to those of Deloitte (2007). It should be emphasised that there are several differences between the two studies and the two time periods covered by the two studies. Therefore, the results of the present study and those of Deloitte (2007) are not strictly comparable.

The deterrence effect of competition law investigations

- 8.5 Our assessment of the deterrent effect of OFT competition law investigations is based on respondents' self-reported behaviour in the business survey. Respondents to the survey were asked whether their company had 'abandoned or significantly modified its behaviour primarily due to the risk of an OFT investigation' and, if so, how many times they had done so since 2003.
- 8.6 The results summarised in Table 8.1 show the number of businesses that have changed their behaviour due to the risk of one of the three types of OFT investigation. Within the group of businesses that did change their behaviour, a considerably higher share of large firms than small firms

have changed their behaviour, and cartel investigations resulted in the most behavioural changes (compared to the other two types).

Table 8.1: Deterrence of commercial law investigations 2003-11 as reported by companies

	Small (< 200 employees)			Large (200+ employees)		
	Firms that changed behaviour		Average number of changes, given firm changed	Changed (%)		Average number of changes, given firm changed
	Number	% of small companies in sample		Number	% of large companies in sample	
Cartel	2	0.65%	-*	23	4.59%	1.36**
Other commercial agreements	2	0.65%	1	18	3.59%	1.1***
Abuse	0	0.00%	-	9	1.80%	1

Source: Business survey. Based on 308 responses from small firms and 501 responses from large companies. * No numerical responses were given. ** Excluding an outlier response of 40. *** Excluding an outlier response of 20.

8.7 For each type of investigation, the deterrence ratio is the estimated number of changes in behaviour by UK firms due to the risk of an OFT investigation (based on the survey responses), divided by the total number of investigations of that type undertaken by the OFT (for more details on the calculation methodology see Annex 0).

8.8 The business survey responses imply that:

- For every cartel investigation undertaken by the OFT since 2003, there were 28 changes in behaviour by the whole population of large UK firms due to the risk of such an investigation (that is, the deterrence ratio is 28:1).
- For each OFT investigation involving a potentially anti-competitive agreement since 2003, there were 40 changes in behaviour by the

whole population of large UK firms due to the risk of such an investigation (that is, the deterrence ratio is 40:1).

- For every OFT abuse of dominance investigation since 2003, there were 12 changes in behaviour by the whole population of large UK firms due to the risk of such an investigation (that is, the deterrence ratio is 12:1).

8.9 Deterrence ratios are not calculated for small companies since there is large uncertainty around these estimates (the 95 per cent confidence intervals include zero, thus the estimates are not significantly different from zero in a statistical sense). This uncertainty arises because a much smaller share of the small business population was sampled for the survey.

8.10 The deterrence ratios and confidence intervals for competition law interventions are summarised in Table 8.2.

Table 8.2: Deterrence ratios 2003-11: Number of cases deterred for every OFT investigation

	Cases deterred (large companies: 200+ employees)
Cartel	28:1
Other commercial agreements	40:1
Abuse of dominance	12:1

Note: 95 per cent confidence intervals: Cartel 16-41; Other commercial agreements 21-58; Abuse of dominance 4-20. See Annex 0 for detailed calculations of the deterrence ratio and the 95 per cent confidence intervals.

8.11 The present study also undertook a survey of legal professionals, asking them to assess the frequency with which they experience deterrence arising from the risk of OFT investigations on a scale from 'always' to 'never'. The results strongly suggest that companies do alter their behaviour due to the risk of an OFT investigation (Figure 8.1).

- The vast majority (89 per cent) said that their clients frequently, sometimes or occasionally modified their initiatives or behaviour

significantly due to the risk of an OFT abuse of dominance investigation.

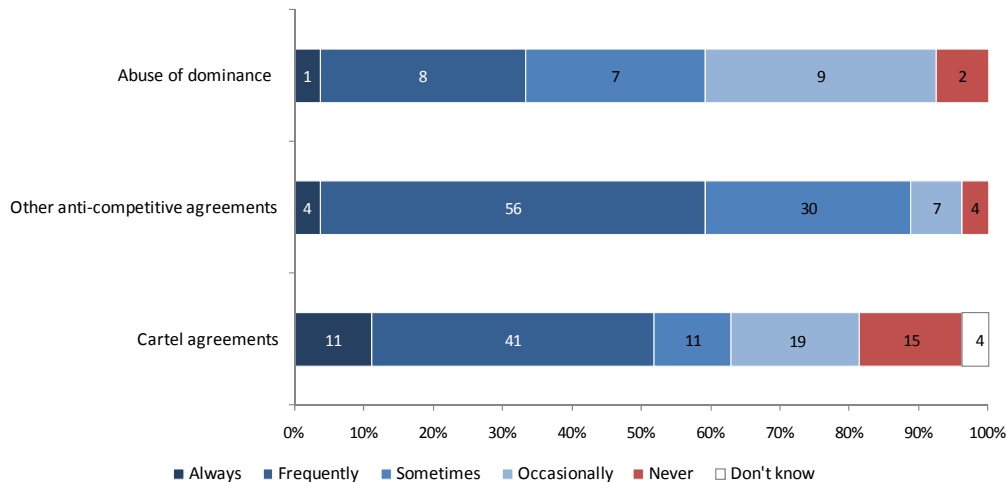
- The majority (56 per cent) also said that their clients frequently significantly modified agreements or proposed agreements as a result of the risk of an OFT investigation into anti-competitive agreements other than cartels.
- More than one-in-10 (11 per cent) claimed that clients always significantly modified agreements or proposed agreements with other firms primarily because of the risk of an OFT cartel investigation, and a further 41 per cent said that this frequently occurs.

8.12 These results generally corroborate the business survey findings, since both surveys indicate that firms do change their behaviour because of the threat of an OFT investigation.

8.13 It should also be noted that two legal professionals argued that companies involved in cartel behaviour are unlikely to discuss this with legal advisors.

8.14 Unlike Deloitte (2007), this study does not attempt to estimate deterrence ratios based on the legal survey. This is because, compared to Deloitte (2007), the sample of lawyers is much smaller, making it impossible to calculate deterrence ratios.

Figure 8.1: Legal professional's experience of clients abandoning or significantly modifying activities because of the risk of an OFT investigation



Source: Legal survey. Based on 27 responses.

8.15 Finally, it should be noted that it is possible that some of the deterrent effect captured in the deterrence ratio estimates is actually attributable to the actions of other institutions, for example the European Commission or the sectoral regulators, because respondents may not be entirely certain about the distinction between the different regulators. We note that competition lawyers consulted for the study suggested that it is questionable whether the deterrent effect of different regulators and competition authorities can be separated.

The current results relative to the Deloitte (2007) results

8.16 While the results of the present study and those of Deloitte are not strictly comparable, this section points out differences and similarities between the current study and Deloitte (2007).

8.17 At first glance the deterrence ratios estimated in this study seem higher than the estimates obtained by Deloitte (2007). However, there are a number of methodological differences:

- First, Deloitte (2007) base their deterrence ratio on only a subsample of companies with 500 employees or more. This was done to reduce the possible impact of outliers because the study was based on a smaller number of observations than the present study. This difference implies that the business population used by Deloitte (2007) is smaller than the business population used to arrive at the estimates reported in the present study. Using a smaller business population reduces the estimated deterrence ratio proportionally, since the population is used to scale-up the findings from the business survey (see Equation F-1 in Annex F). Therefore, by using a smaller sample, and including firms of more than 500 employees only, the Deloitte estimate may underestimate the level of deterrence in the business population.
- Second, Deloitte (2007) uses slightly more conservative figures on the size of the business population than we do since they use ONS data which include only VAT registered enterprises. In comparison, we use BIS data which also include estimates of unregistered companies. We have chosen to use the BIS data because inclusion of unregistered companies may be important for companies with less than 500 employees. As noted above, Deloitte (2007) do not include companies with less than 500 employees in their sample and hence have less reason to be worried about excluding unregistered companies.
- Furthermore, Deloitte (2007) assume that each company only has changed behaviour once over a seven year period. We do not impose this assumption and as a result slightly higher deterrence estimates are likely to be observed.
- Finally, the two studies do not cover the same period. Our study covers the period from 2003 to 2011 whereas the Deloitte (2007) study covers the period from 2000 to 2007. This implies that the number of cases undertaken by the OFT differs. In fact, more cartels cases, the same number of commercial agreement investigations and fewer abuses of dominance investigations have been undertaken during the period considered for this study. There may also be other

factors which influence business behaviour differently between the two time periods that the survey does not pick-up.

8.18 The impact of these methodological differences can be quantified by recalculating the deterrence ratio using the same methodology as Deloitte (that is, the same assumed size of the business population, assuming that each company has only changed behaviour once and basing the calculations only on the sample of firms with more than 500 employees). The resulting deterrence ratios, reported in Table 8.3, are lower than the best estimates reported above.

8.19 All of these deterrence ratios are smaller than those reported by Deloitte (2007), although it should be noted that, for abuse of dominance and other commercial agreements, the 95 per cent confidence intervals overlap. Like Deloitte, we find that the largest deterrence ratio is for commercial agreements.

Table 8.3: Deterrence ratios 2003-11 using Deloitte's methodology: Number of cases deterred for every OFT investigation

	Deterrence ratio 2003-2011	Deterrence ratio 2000-2007 (Deloitte, 2007)
Cartel	4	16
Other commercial agreements	14	29
Abuse of dominance	7	10

Note: Deterrence ratio 2003-2011: 95 per cent confidence intervals: Cartel 1-7; Other commercial agreements 5-23; Abuse of dominance 2-12. Deterrence ratio 2000-2007 (Deloitte, 2007) 95 per cent confidence intervals: Cartel 9-24; Other commercial agreements 17-41; Abuse of dominance 4-16. See Annex F for detailed calculations of the deterrence ratio and the 95 per cent confidence intervals.

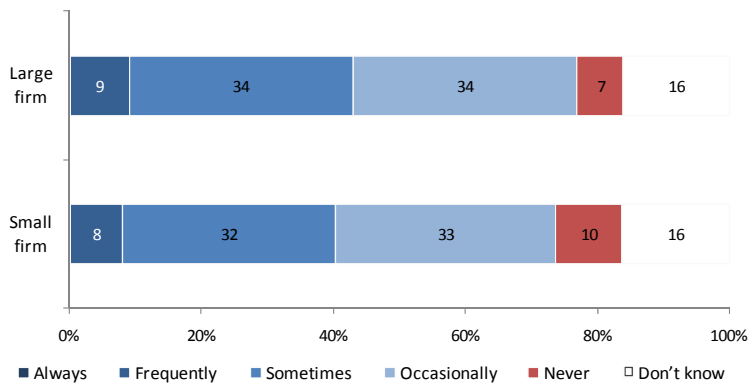
Over-deterrence with respect to commercial agreements

8.20 According to business stakeholders, the sheer hassle of going through an investigation is an important deterrent of anti-competitive behaviour. However, if this is the case, there is a risk that activities that would not have been anti-competitive are also deterred.

8.21 Generally, respondents to the business survey think that this can happen. Only seven per cent of large businesses and 10 per cent of small businesses believe that it never happens. However, around one in three businesses (small and large) believe that the competition regime occasionally deters activity that would not have been anti-competitive and one in three companies (small and large) believe that this sometimes happens.

8.22 It is, however, encouraging that no respondents indicated that this always happens in their opinion, and only nine per cent and eight per cent of large and small business respondents believe that this happens frequently.

Figure 8.2: Businesses' experience of over-deterrence: how often does the competition regime deter commercial agreements that would not have been anti-competitive?



Source: Business survey. Based on 308 responses from small companies and 501 responses from large companies.

The deterrent effect of merger investigations

8.23 Because potential benefits arise from many mergers (such as economies of scale, improved efficiency, and stronger international competitiveness), this section examines both the deterrent effect and over-deterrence of mergers investigations.

8.24 When assessing the deterrent effect of the OFT with respect to anti-competitive mergers, only mergers that would have qualified for an investigation under the UK merger regime should be considered.

Deterrent effect overview of merger investigations

8.25 Figure 8.3 gives an overview of what happened to mergers considered by large firms (since 2003) that qualified or would have qualified for investigation ('qualified' in the view of survey respondents).

8.26 We note that a similar analysis is not undertaken for small firms because only three mergers that would have qualified were considered by small firms in our sample. One of these mergers was abandoned for competition concerns before the OFT became aware of it and two went ahead without an investigation, although one of the respondents considered that the merger should have been investigated.

8.27 Large companies in our sample considered a total of 33 qualifying mergers since 2003. This is considerably lower than the number of the qualifying mergers reported by firms surveyed for the Deloitte (2007) report (especially given the larger sample and longer reference period of our survey).

8.28 The number of qualifying mergers from our survey is low partly because many firms who reported that they **had** considered a merger also reported, in the next question, that they believe these mergers **did not** qualify for investigation. The Deloitte survey established the same information, but uses a single question.⁴¹

8.29 For both surveys, there is the possibility that some respondents may have misinterpreted the meaning of 'qualified for investigation' and so understated or overstated the number of qualifying mergers, since neither survey provided an explanation of the phrase.

⁴¹ Specifically, Deloitte did not screen respondents by asking if they had considered a merger before asking them if the mergers they had considered would have qualified for investigation.

- 8.30 Further, in our survey 15 firms (that is, 14 per cent of those who had considered a merger) responded that they 'don't know' how many of the mergers that they had considered qualified for investigation (the Deloitte survey did not give the option to respond 'don't know'). Had these firms been required to provide an answer (that is, could not opt for don't know), one would expect the number of qualifying mergers from our survey to have been higher.
- 8.31 Of the 33 qualifying mergers considered by large companies in our sample, nine (27 per cent) were not completed. Of these, six (18 per cent of mergers considered) were abandoned for competition reasons, two (six per cent of the total) were abandoned because of the cost and complexity associated with an investigation, and one was abandoned for another reason.
- 8.32 Some of the mergers that went ahead (whether investigated by the OFT or not) were modified before the OFT became aware of them. Five (15 per cent of mergers considered) were modified before the OFT became aware of them for competition reasons, and one was modified due to the cost and complexity of an investigation.
- 8.33 Most of the mergers considered by large companies went ahead, and fourteen (42 per cent of mergers considered) were investigated by the OFT. This implies that the OFT investigated more than half (14 out of 24) of the mergers that went ahead and qualified for investigation under the UK competition regime.
- 8.34 The majority (10 out of 14) of the mergers in our sample that were investigated by the OFT were subsequently modified. Six (18 per cent of mergers considered) led to undertakings-in-lieu of referral to the CC.
- 8.35 Finally, 10 (42 per cent) of the mergers in our sample that went ahead were not investigated by the OFT and respondents believed that three of these should have been investigated and might have given rise to competition concerns. This suggests that for every fourteen mergers investigated by the OFT, three mergers that should have been investigated are missed. However, most of the mergers that went ahead

without investigation would not have given rise to competition concerns according to the respondents.

Figure 8.3: Mergers considered by large companies since 2003 that would have qualified for investigation (number of mergers)

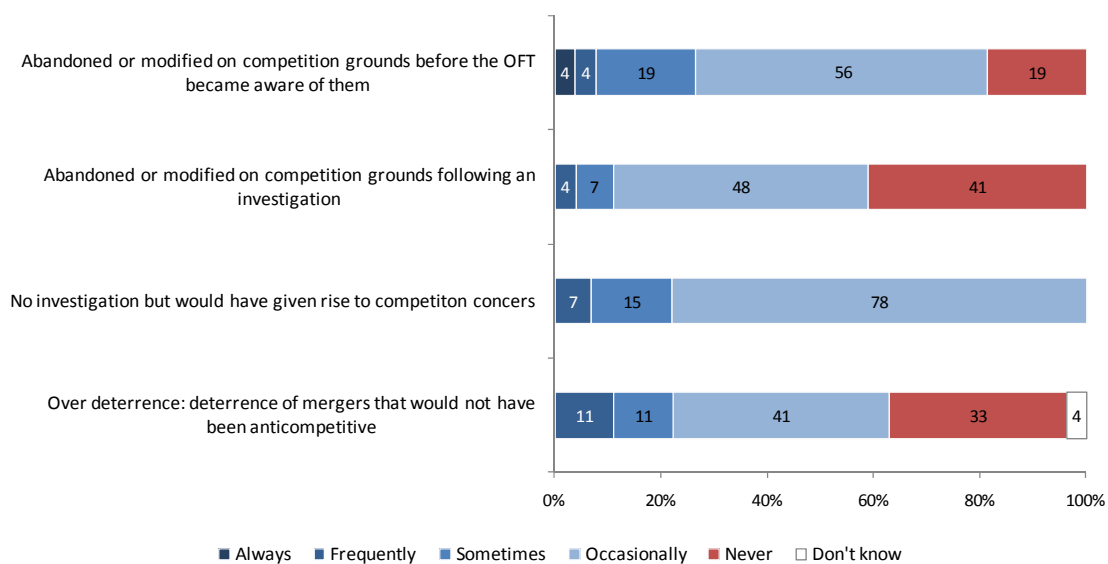


Source: Business survey. Includes only large firms that is, firms with 200+ employees. Based on 501 responses from large companies. Blue indicates that number comes directly from survey results. Red indicated that the number was calculated based on responses to the survey.

8.36 Legal professionals answering the legal survey were asked to assess the frequency with which mergers are abandoned or modified on competition grounds before the OFT becomes aware of them. More than half (56 per cent) reported that it occurs occasionally (Figure 8.4), generally supporting the findings from the business survey (illustrated in Figure 8.3). Five legal professionals (19 per cent) said it never occurs, whereas one said it always happens, commenting that clients do not tend to consider a merger if they have concerns about anti-competitive behaviour.

8.37 The legal professionals were also asked to assess how often mergers are abandoned or modified following an investigation. The vast majority said that mergers are never or only occasionally changed after an investigation. On average, legal professionals believe that this happens less frequently than abandonment/modification before the OFT becomes aware of the case, suggesting that firms adapt their behaviour in order to pre-empt potential competition concerns.

Figure 8.4: Legal professional's experience of mergers



Source: Legal survey. Based on 27 respondents.

The deterrence ratio

- 8.38 Given the relatively small number of reported qualifying mergers that were abandoned or modified before the OFT became aware of them, and the small number that led to a finding of Significant Lessening of Competition (SLC) or Undertakings in Lieu (UiL), we do not believe it is appropriate to draw precise conclusions about the scale of the deterrent effect by calculating a deterrence ratio.
- 8.39 However, the shares of qualifying mergers reported by large firms in our sample that were abandoned or modified on competition grounds are compared with the share that resulted in a finding of SLC or UiL in Table 8.4.
- 8.40 Although the numbers of mergers falling into each category are similar to those found by Deloitte (2007), based on our survey the shares in each category are notably higher, due to the lower total number of qualifying mergers.

Table 8.4: Qualifying mergers considered by large companies 2003-11

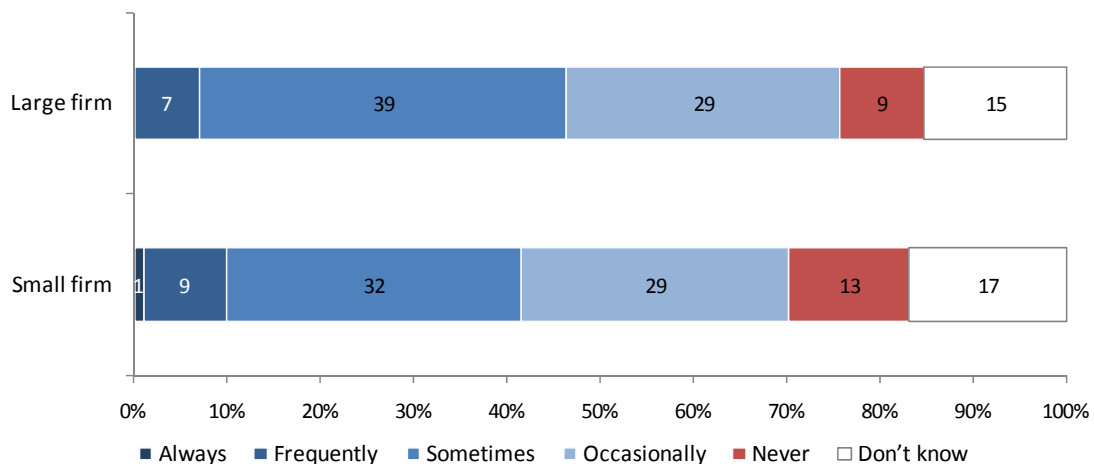
	Number reported	Percentage of mergers considered
Qualifying mergers considered	33	100%
Abandoned on competition grounds before the OFT became aware of them	6	18%
Modified on competition grounds before the OFT became aware of them	5	15%
Finding of SLC or led to undertakings in lieu	6	18%

Source: Business survey.

Over-deterrence

- 8.41 In the case of mergers, the survey questions allow us to make the distinction between whether behaviour was modified due to the cost and complexity of an investigation or for competition reasons. In the former situation, there is over-deterrence.
- 8.42 When asked about over-deterrence, businesses indicated that it does happen that mergers that would not have lessened competition are deterred. Only nine per cent of large companies and 13 per cent of small companies reported that the competition regime never deters mergers that would not have lessened competition (this is of the same order of magnitude as the results reported for competition law investigations, Table8.3).

Figure 8.5: Businesses' experience of over-deterrence: how often does the competition regime deter mergers that would not have lessened competition?



Source: Business survey. Based on 308 responses from small companies and 501 responses from large companies.

- 8.43 The shares of qualifying mergers reported by large firms in our sample that were abandoned or modified due to the cost and complexity of being assessed by the competition authorities are shown in Table 8.5.

However, since the number of mergers involved is small, we do not make precise calculations about the level of over-deterrence.

8.44 The results of the survey suggest no over-deterrence among small companies. However, we note that in a larger sample some level of over-deterrence for small companies may have been observed.

Table 8.5: Qualifying mergers considered by large companies 2003-11

	Number reported	Percentage of mergers considered
Qualifying mergers considered	33	100%
Abandoned due to cost and complexity of investigation before the OFT became aware of them	2	6%
Modified due to cost and complexity of investigation before the OFT became aware of them	1	3%
Finding of SLC or led to undertakings in lieu	6	18%

Source: Business survey and BIS. See Annex F for detailed calculations of the deterrence ratio and 95 per cent confidence interval.

8.45 Surveyed legal professionals usually reported that the UK competition regime only occasionally or never deters mergers that would not have been anti-competitive (Figure 8.4). This corroborates the Deloitte (2007) study, which found that legal advisors felt over-deterrence was more common for competition law matters than for mergers, indicating that competitive mergers were not deterred very often. Generally, legal professionals perceive there to be a lower level of over-deterrence than do businesses (comparing Figure 8.4 with Figure 8.5).

8.46 It was also noted by one legal professional that the European system was more of a deterrent. Another mentioned that the UK competition regime doesn't deter mergers that are not anti-competitive since it is a voluntary system and therefore there are no associated costs as there would be with mandatory notification.

Missed cases

- 8.47 Among the mergers reported by large firms in our business survey that went ahead, 10 (42 per cent) were not investigated by the OFT. Respondents believed that three of these should have been investigated and might have given rise to competition concerns. This suggests that for every 14 mergers investigated by the OFT, three mergers that should have been investigated are missed. However, according to the respondents, most of the mergers that went ahead without investigation would not have given rise to competition concerns.
- 8.48 Respondents to the legal survey all agreed that some cases that would have given rise to competition concerns were not investigated by the competition authorities. However, 21 out of 27 legal professionals (78 per cent) said that this situation only occurs occasionally.

9 EFFECTIVENESS OF THE UK COMPETITION REGIME

9.1 This chapter analyses the perceived effectiveness of the UK competition regime at achieving deterrence. First, the perceptions of businesses are considered and then those of legal professionals. Finally, we review suggested improvements that might enhance the effectiveness of the UK competition regime in the view of survey respondents.

Perceptions of businesses

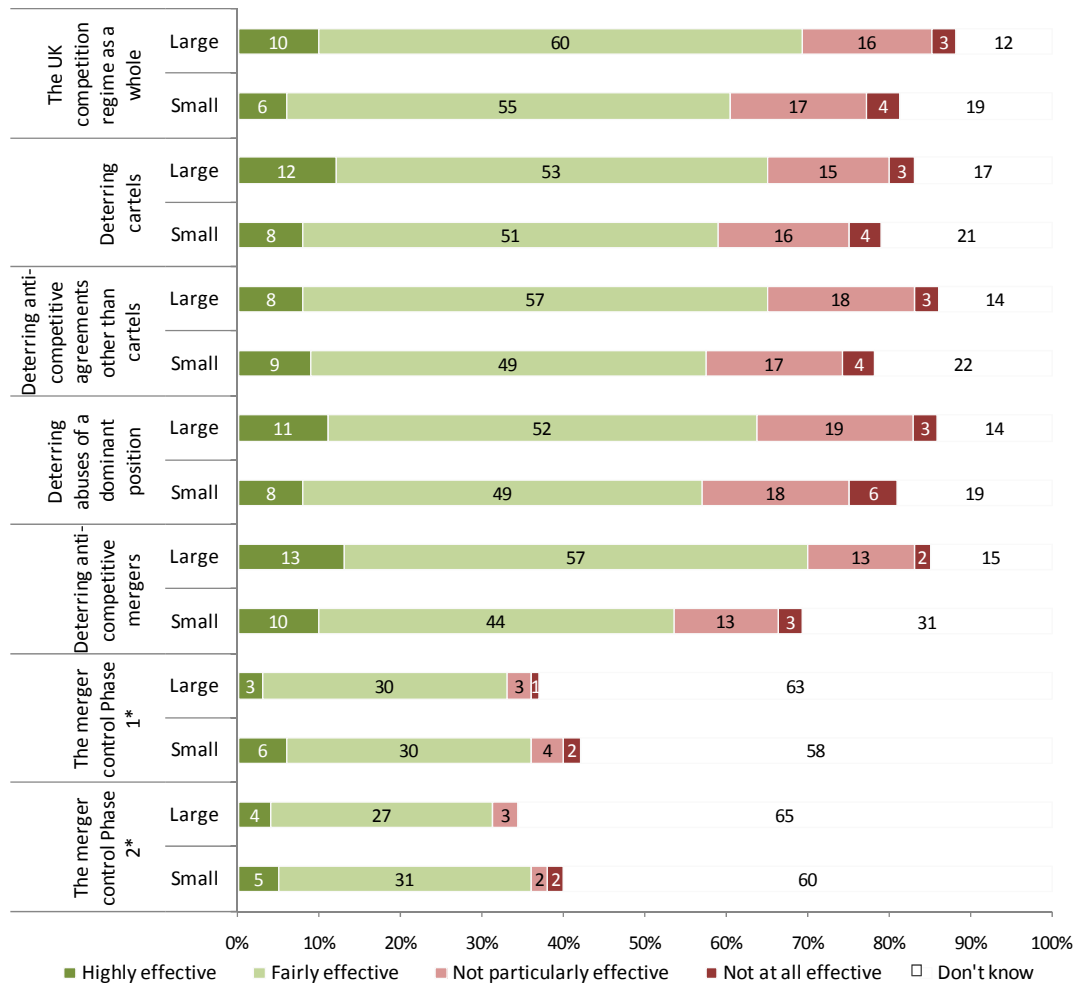
9.2 Most businesses perceive the UK competition regime as a whole as fairly effective. In terms of the perceived effectiveness of deterring different types of anti-competitive behaviour, it is generally the case that the majority of respondents from both small and large companies believe that the regime is highly or fairly effective. There is little variation in the ratings of effectiveness across different types of potentially anti-competitive behaviour.

9.3 The only exception relates to the views about effectiveness of phase 1 and 2 of the merger regime. In these cases, the majority of the respondents did not know how to rate the effectiveness of the regime, even though these particular questions were only put to respondents who had indicated awareness of the respective roles of the OFT and the CC in merger control. The result is probably due to the fact that many companies have not had actual experience with the two phases of the merger control regime and therefore do not feel confident to rate the effectiveness. However, when the effectiveness is rated, most respondents rate both phases as highly or fairly effective. In addition, respondents rated deterring anti-competitive mergers as highly to fairly effective.

9.4 There is little discernable difference in the results of the business survey concerning the perceived effectiveness of the OFT in deterring different types of anti-competitive behaviour. This contrasts with Deloitte (2007), in which respondents considered that the OFT was most effective in deterring cartels, less effective in deterring other forms of anti-

competitive agreements and least effective in deterring abuses of dominance.

Figure 9.1: Business perceptions of the effectiveness of different aspects of the UK competition regime in terms of preventing anti-competitive conduct



Source: Business survey. Based on 308 responses from small firms and 501 responses from large firms.

*Indicates that the question was only addressed to the sub-sample of respondents who had previously indicated that they knew the roles of the OFT and the CC in merger control.

- 9.5 Generally, representatives of small companies were less certain about the effectiveness of various aspects of the OFT competition regime and, therefore, more likely to respond 'don't know'. Moreover, small companies rate the effectiveness of the UK competition regime slightly less favourably than large companies.
- 9.6 There are generally no large and statistically significant differences in perceptions of effectiveness by businesses in sectors with and without competition law and merger interventions since 2003. However, it is noteworthy that businesses in sectors with competition law interventions since 2003 are more likely to believe that the UK competition regime is highly or fairly effective in preventing other commercial agreements than businesses in sectors with no competition law intervention. This conclusion also holds when comparing the views of businesses in sectors with commercial agreement investigations to those of businesses in sectors with no such investigations. Similar conclusions do not apply to other types of potentially anti-competitive behaviour.
- 9.7 When comparing the views of businesses in sectors with merger investigations since 2003 to those in sectors with no merger investigations in that period, one notes very few marked differences. However, businesses in sectors with no merger investigations are significantly more likely to believe that the UK competition regime as a whole is fairly or highly effective at deterring anti-competitive behaviour. It is not obvious why this is the case.

Perceptions of legal professionals

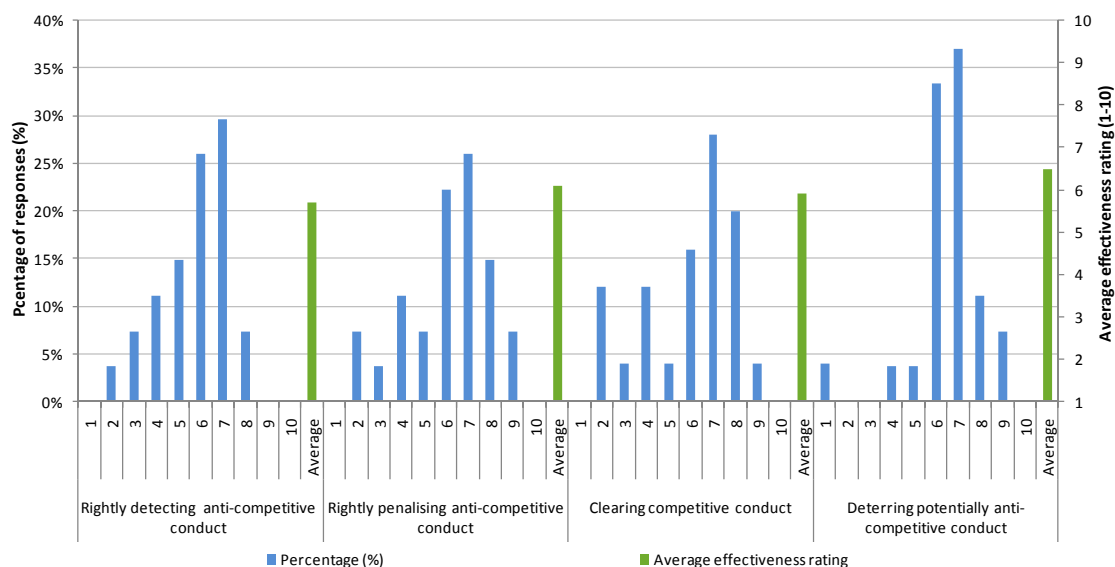
- 9.8 Legal professionals were asked to assess various aspects of the UK competition regime on a scale from 1 (not at all effective) to 10 (highly effective). Overall, the results suggest that there is still scope for improvements in effectiveness, particularly with respect to enforcement of competition law.

Competition law regime

- 9.9 The OFT's effectiveness in terms of rightly detecting anti-competitive conduct is, on average, rated 5.7 on the 10-point scale and the distribution of responses peaks at seven with no respondents giving this aspect of the competition regime a rating of nine or 10 (Figure 9.2).
- 9.10 The OFT is, on average, rated slightly higher with respect to rightly penalising anti-competitive conduct. The average rating on the 10-point scale is 6.1 and the distribution of responses again peaks at seven. However, there is wider dispersion in the responses indicating less agreement among respondents about the effectiveness. The responses could suggest that legal professionals experience some type II enforcement errors, that is, that anti-competitive behaviour in some cases is wrongly cleared.
- 9.11 On average, the effectiveness with respect to rightly clearing competitive conduct is rated 5.9 on the 10-point scale.⁴² The relatively low rating suggests that there may be room for improvement in this respect and that legal professionals believe that some type I enforcement errors occur in competition cases. That is, in some cases competitive conduct is not cleared even though it should have been.
- 9.12 The aspect of the OFT's competition law enforcement activity that is rated highest is the deterrent effect. The OFT's ability to deter potentially anticompetitive conduct is, on average, rated 6.5 with the vast majority of responses centred around 6 and 7.

⁴² We note that there were two 'don't know' responses and one of these respondents said that he/she did not 'see pre-clearance as part of the OFT regime'.

Figure 9.2: Effectiveness with respect to competition law issues



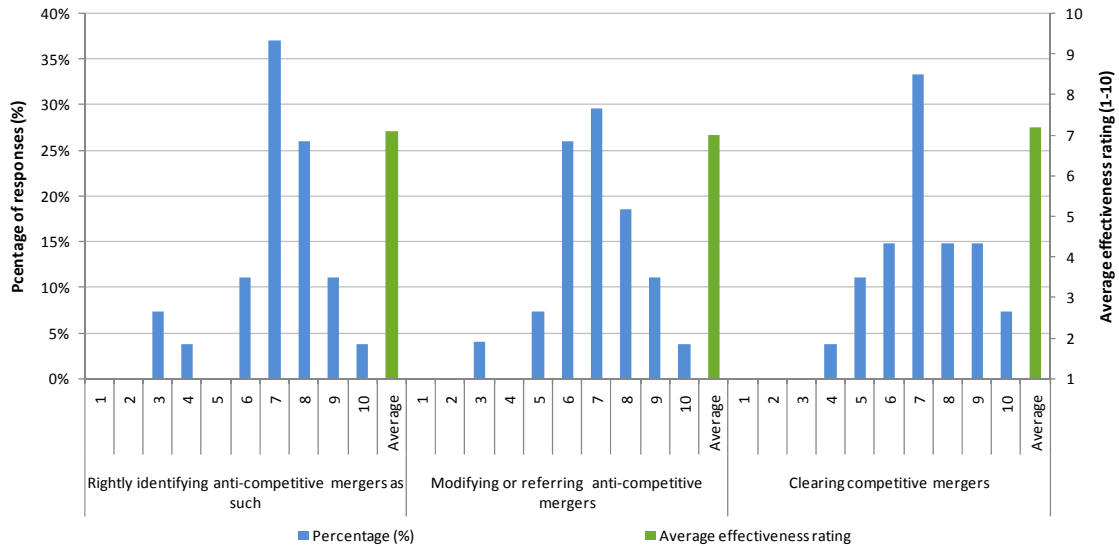
Source: Legal survey. Based on 27 responses.

Merger regime

- 9.13 The OFT's effectiveness in merger cases is generally rated more highly than the effectiveness in competition law cases.
- 9.14 In particular, the effectiveness in terms of rightly identifying anti-competitive mergers is, on average, rated seven on the 10-point scale. This suggests that the perceived probability of detection of anti-competitive mergers is higher than the perceived probability of detection of other types of anti-competitive behaviour (with an average rating of 5.7).
- 9.15 In addition, there appears to be fewer perceived enforcement errors in merger cases than in competition law cases. The effectiveness of the OFT with respect to rightly modifying or referring anti-competitive mergers is, on average rated seven (the comparable figure in competition law cases is 6.1). An interpretation of this could be that type 2 errors are less likely in merger cases than in competition law cases, that is, it is less likely that the OFT falsely clears potentially anti-competitive behaviour in merger cases than in competition law cases.

9.16 Similarly, with an average rating of 7.1, the effectiveness of the OFT with respect to clearing competitive behaviour is, on average, rated higher in merger cases than in competition law cases (average of 5.9). This suggests that there are fewer type 1 errors in merger cases.

Figure 9.3: Effectiveness with respect to merger issues



Source: Legal survey. Based on 27 responses.

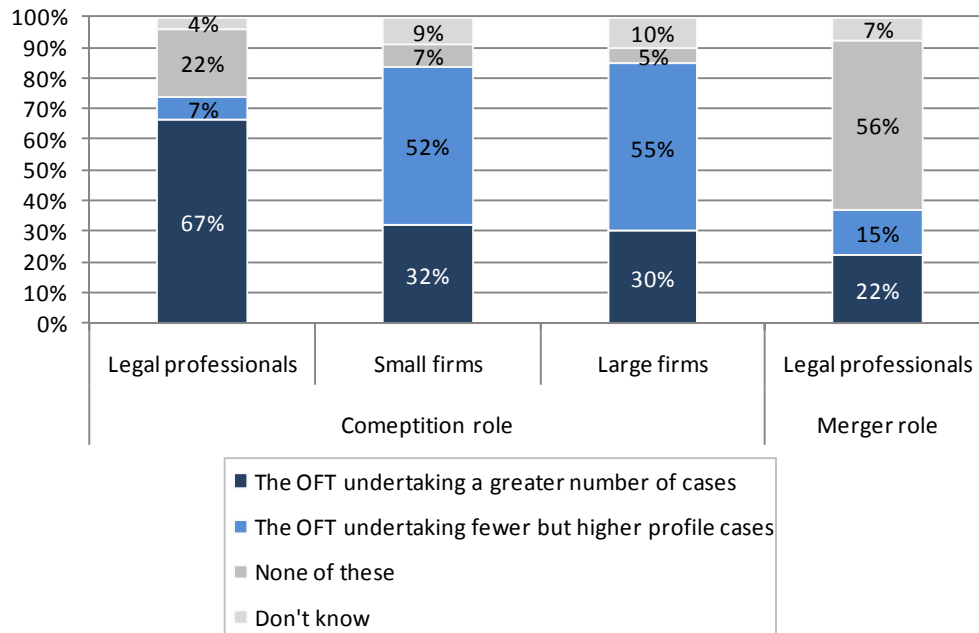
Suggested improvements

9.17 There is significant disagreement among different types of respondents with respect to what could improve the effectiveness of the OFT in its competition and merger roles.

9.18 With respect to the OFT's competition role, most legal professionals (67 per cent of respondents) believed that the OFT's effectiveness would be most improved if the OFT were to undertake more cases. However, the majority of both small and large businesses believed that the effectiveness would be most improved if the OFT were to undertake

fewer but more high profile cases.⁴³ It is important to note that the term 'high profile' case was not defined in the survey, and therefore the interpretation of high profile is subjective.

Figure 9.4: What would improve the OFT's effectiveness?



Source: Legal survey and business survey. Based on 27 responses from legal professionals, 249 responses from small firms (200 or fewer employees) and 428 responses from large companies (>200 employees). Note that respondents to the business survey only responded to the question if they had demonstrated some knowledge of the OFT's role.

9.19 With respect to the OFT's merger role, most legal professionals rejected both solutions. One respondent mentioned it was not clear how the OFT could feasibly investigate more cases or focus more on high profile cases as the OFT already looks into most cases. Therefore, it was not clear to the respondent how the regime could be improved in either respect.

⁴³ We note that there are no statistically significant differences between business views of respondents in sectors with and without competition law and merger investigations since 2003.

9.20 Another respondent commented that the best solution would be mandatory notification which would automatically involve the OFT undertaking more cases including more high profile cases. Finally, a legal professional commented that the merger policy works reasonably well as it is and that there is no need to improve effectiveness.

10 CONCLUSIONS AND POLICY OBSERVATIONS

10.1 In this chapter we provide an overview of the concluding findings from the study, and we provide a set of policy observations arising from these conclusions.

Conclusions

- 10.2 Overall the analysis indicates that knowledge and awareness of competition law and specific competition interventions is limited, especially among small businesses. This finding suggests that there is potential scope for improvements in awareness and knowledge, and the OFT could potentially improve competition compliance by increasing awareness and knowledge of competition issues, particularly amongst small business.
- 10.3 Knowledge and awareness of competition law is an important element for compliance, and is identified by the OFT in its study of the drivers of compliance and non-compliance, and in its subsequent guidance (June 2011) as an important element for businesses to identify areas of competition compliance risk.
- 10.4 One possible improvement identified by business stakeholders would be to shorten guidance where feasible, and to make use of more examples. It should be noted however, that this is a suggestion from only a very small sample of business stakeholders, and this question was not posed to businesses themselves.
- 10.5 The survey evidence shows that specific interventions that led to high awareness amongst businesses tended to result in greater behavioural change than lesser known cases. For example, the price fixing of replica football kits cartel case, and the case of price co-ordination involving the UK grocery sector. Due to the low number of reported cases of behavioural change we cannot assess if behavioural change is greater in sectors affected by an investigation than in other sectors. Nevertheless, there is evidence that enforcement actions may have positive spill-over effects in terms of improved knowledge about competition issues and in

terms of wider use of voluntary compliance measures in companies affected by OFT competition investigations.

- 10.6 While the deterrent effect of specific OFT investigations may be limited, there is clear evidence that businesses perceive OFT enforcement tools and sanctions as important deterrents of competition infringements. Most important are fines to the company, reputational damage to the company and criminal sanctions.
- 10.7 Importantly, reputational damage appears to arise both from a decision and from an investigation by the competition authority. So competition authorities should be mindful that even investigations leading to a non-infringement decision may have adverse effects on businesses involved.
- 10.8 There is some evidence that relatively new and lesser known enforcement tools such as leniency programmes have less deterrent effect on businesses. This may to some degree reflect low awareness and it is clear that legal professionals view leniency programmes as a much more important deterrent than businesses.
- 10.9 This study also included a novel behavioural experiment. The experiment showed that actual behaviour does not only depend on expected returns of legal versus illegal activity. However, it does seem to respond to financial incentives, that is, a high probability of detection, a high sanction and a low gain from cartel activity.
- 10.10 However, compliance may also be driven by social concerns and high levels of risk aversion, and a large proportion of participants in the experiment would never choose in the risky cartel option.
- 10.11 At the same time, there appears to be a group of people who display risk loving behaviour, that is, they are always willing to choose the cartel option because it involves the possibility of a high gain. Deterring this group remains a challenge for competition authorities.
- 10.12 Competition authorities should also be mindful that a high level of knowledge about competition law issues could be a sign of potential risk

of non-compliance. Knowledge appears to make it more likely that people choose the risky cartel option in the experiment.

- 10.13 Although most large companies already use some voluntary compliance measures, there is still scope to formalise competition compliance further; especially in small businesses. It should be noted, however, that highly formalised and involved compliance measures may not be desirable in all companies because of the risk of excessive compliance costs for companies. This may explain why small companies are less likely to use compliance processes and instead may deal with compliance issues on a more ad-hoc basis.
- 10.14 The most common compliance measure taken by businesses is to seek external advice. It is therefore important that advice provided by legal advisers is well informed and accurate. OFT guidance and decisions appear to be useful for legal professionals in this respect.
- 10.15 The OFT in 'Drivers of compliance and non-compliance' suggests a four step approach to effective competition law compliance culture (2010c). Risk assessments are one of the key steps to ensuring a commitment to compliance. In businesses surveyed for this study, the second most common compliance measure is to carry out competition risk assessments.
- 10.16 The deterrence ratios calculated for large firms in this study show that the greatest deterrence effect is from investigations into other commercial agreements. For every commercial agreement case undertaken by the OFT, 40 cases are deterred. For cartels, 28 cases are deterred for every case investigated by the OFT and for abuse of dominance, 12 cases are deterred for every case undertaken by the OFT.
- 10.17 The deterrence ratios for mergers are not calculated due to the small number of 'qualifying' mergers identified by business respondents.
- 10.18 Most businesses perceive the UK competition regime as a whole as fairly effective and this is also the case when considering the effectiveness with respect to deterring all the different types of anti-competitive behaviour.

10.19 Legal professionals generally indicate that there is room for improvement in the UK competition regime. In particular, legal professionals suggest that:

- the probability of detection is relatively low in competition cases
- there are some cases of type II enforcement errors, that is, that anti-competitive behaviour is wrongly cleared
- there are some type I enforcement errors in competition cases, that is, competitive conduct sometimes is not cleared although it should have been.

10.20 However, overall the OFT's ability to deter potentially anticompetitive conduct is rated relatively favourably. The OFT's effectiveness in merger cases is generally rated more favourably than the effectiveness in competition law cases in all of these respects.

Policy observations

10.21 Overall, our analysis suggests that there are important wider benefits associated with OFT enforcement activities and that the UK competition regime is generally perceived effective in terms of achieving deterrence and compliance.

10.22 Sanctions and enforcement in the UK appear to have a substantial deterrent effect. For example, every anti-competitive agreement investigation undertaken by the OFT deterring 40 cases.

10.23 However, businesses' knowledge and awareness of competition law, especially small businesses, is limited. Only 35 per cent of small businesses reported that they feel very or fairly knowledgeable about competition law.

10.24 Further, few companies have compliance measures in place: Fifty-eight per cent of small companies surveyed and 37 per cent of large companies have no compliance measures.

- 10.25 Therefore, methods for improving knowledge and encouraging voluntary compliance measures may be avenues for improving compliance. For example, increasing the use of risk-assessments within business that report they do not have any compliance measures. New OFT guidance (June 2011), published after the survey for this study was completed, includes risk assessments as an important step in achieving compliance for businesses.
- 10.26 Ensuring guidance is simple, where feasible providing short guidance and using examples as an illustrative method, may help small businesses who most likely face greater resource constraints than large businesses in assessing competition law guidance.
- 10.27 Indirectly, the OFT could improve knowledge and awareness through the general press and trade journals. Small businesses may be better reached through the general press or trade journals. In the survey, these sources were the two most commonly used sources of information by small companies compared to OFT website and legal publications or journals used by large businesses.
- 10.28 The OFT may also improve awareness of competition issues and perhaps behavioural effects of specific interventions by undertaking 'higher profile' cases. Cases that businesses were aware of the name were more likely to be identified as having an impact on business behaviour. It is of course difficult to identify *ex ante* if a case will be 'high profile'. However, when specifically asked what the OFT could do to improve effectiveness, businesses reported that fewer and more high profile cases would be more effective at improving the effectiveness of the regime. On the other hand, legal professionals reported that a greater number of cases would contribute to raise awareness of competition issues.

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A DEFINITIONS AND COMPETITION AUTHORITIES IN THE UK

- A.1 This annex provides key definitions relevant to the study and an overview of the roles and responsibilities of the OFT, the Competition Commission and European-level competition authorities.

Definitions

Deterrence

- A.2 The economic literature distinguishes between two types of deterrence: general and specific.
- A.3 Drago et al. (2009) define the general deterrent effect as the 'discouragement of criminal behaviour (...) induced by the increase in its relative price'. The relative price of illegal behaviour is influenced by parameters of the enforcement regime such as the probability of detection and the severity of sanctions imposed when breaches of the law are detected. Hence, for the purpose of this study, general deterrence is defined as 'ex-ante deterrence (...) preventing agents from undertaking illegal behaviours by threatening violators with (...) sanctions'.
- A.4 The specific deterrent effect (for example,, Smith and Gartin, 1989) on the other hand is based on the proposition that agents who have committed illegal activity that has been detected, ex-post respond to their specific experience with the enforcement regime. Agents may, for example, update their information about the enforcement regime (for example,, the probability of detection). The punishment itself may also deter agents from undertaking illegal activity in the future through so-called punishment-induced deterrence. Additionally, the enforcement regime may imply increase penalties and hence costs for repeat offenders and agents would be expected to take these specific circumstances into account.
- A.5 By nature, specific deterrence is related to deterrence of re-offending, whereas general deterrence is a much broader concept which may affect

a much larger number of potential infringements without the need for law enforcers to detect breaches. The focus of this study is on general deterrence and therefore is not limited to businesses that have been subject to OFT investigations.

Abuse of dominance

- A.6 Chapter II of the Competition Act and Article 102 of the Treaty on the Functioning of the European Union (TFEU) prohibit the abuse of a dominant position.
- A.7 A business holds a dominant position in a market if it is able to behave independently of the normal constraints imposed by competitors, suppliers and customers. Holding a dominant position is not unlawful, but it is unlawful to abuse that position. Any anticompetitive conduct by a dominant business which exploits customers or tends to have an exclusionary effect on competitors is likely to constitute an abuse.
- A.8 Examples of the type of conduct that may in some circumstances fall into this category include offering different prices or terms to similar customers; granting rebates to customers that reward them for a particular form of purchasing behaviour, or imposing exclusivity obligations; requiring customers purchasing one product to purchase an additional one (tying or bundling); charging prices so low that they do not cover the costs of the product or service sold; and refusing to grant access to facilities that are essential in order to operate in a market.
- A.9 A company is usually considered to have a potentially dominant position if it has a market share in excess of 40 per cent, although other factors are also considered, including the number and size of competitors and customers and whether new businesses can easily enter the market (OFT, 2010a).

Anti-competitive agreements

- A.10 Chapter I of the Competition Act and Article 101 of TFEU prohibit any agreement or concerted practice between businesses which prevents,

restricts or distorts competition, unless an exclusion or exemption applies.

- A.11 The prohibition can apply to horizontal agreements (between competitors) and vertical agreements (between businesses at different levels of the supply chain). Examples of agreements that may be caught by the prohibition include price fixing; bid-rigging; market-sharing (including sharing customers or territories); agreements between competitors to limit production; sharing certain categories of commercially sensitive information with one or more competitors; and resale price maintenance (OFT, 2010a).

Cartel offence

- A.12 Section 188 of the Enterprise Act provides that an individual is guilty of an offence if he or she dishonestly agrees with one or more other persons that undertakings will engage in one or more of the prohibited cartel activities. These are price-fixing; limitation of supply or production; market-sharing; and bid-rigging.
- A.13 The offence only applies with respect to agreements between undertakings at the same level in the supply chain, known as horizontal agreements. Vertical agreements do not fall within the scope of this offence.
- A.14 An offence will be committed irrespective of whether or not the agreement reached is actually implemented by the undertakings and irrespective of whether or not the individuals have the authority to act on behalf of the undertakings at the time of the agreement. If the agreement between the individuals is made outside the UK, proceedings may only be brought where the agreement has been implemented in whole or in part in the UK (OFT, The Cartel Offence, 2003).

'No grounds for action' decisions

- A.15 If no evidence of a competition law infringement is found, the OFT may publish a decision that there are 'no grounds for action'. In such cases,

the OFT provides a non-confidential version of the proposed decision to the Formal Complainant (OFT, 2011a).

Commitments to stop or modify behaviour or to change business structure

- A.16 If the OFT considers that a case raises competitive concerns, then, instead of making a provisional infringement decision, the OFT may be prepared to accept binding promises or 'commitments' from a business regarding its future conduct. Such commitments may be accepted if the OFT is satisfied that the proposed behavioural change addresses the competition concerns (OFT, 2011a).
- A.17 Furthermore, the OFT is more likely to accept commitments if '(...) the competition concerns are readily identifiable, will be fully addressed by the commitments offered, and the proposed commitments can be implemented effectively and, if necessary, within a short period of time' (OFT, 2011a).
- A.18 However, the OFT is very unlikely to accept commitments in cases involving secret cartels or a serious abuse of a dominant position. A business under investigation can offer commitments at any time during the investigation, however, at a very late stage they are unlikely to be accepted.

Director disqualification orders (DDOs)

- A.19 Under section 9A of the Company Directors Disqualification Act 1986, the OFT and certain sectoral regulators have the power to apply to the court for an order disqualifying a director from being involved in the management of a company: a so-called DDO or competition disqualification order (CDO).

The court must award a CDO if it is satisfied that:

- there has been a breach of UK or EU competition law (involving a company of which the individual was a director), and

- the director's behaviour in connection with that breach makes him unfit to be concerned in the management of a company (OFT, 2010a).

A.23 In making its assessment of whether an individual is 'unfit to be concerned in the management of a company', the court considers whether:

- the director's conduct contributed to the breach of competition law
- the director's conduct did not contribute to the breach but the director had reasonable grounds to suspect that the conduct of the undertaking constituted the breach and he/she took no steps to prevent it, or
- the director did not know but ought to have known that the conduct of the undertaking constituted the breach.

A.24 Therefore, a director should not only refrain from personal involvement in an infringement but must also take reasonable steps to prevent, uncover and bring to an end any infringement by his company, if he wishes to avoid a CDO.

A.25 If a court considers that a director's conduct in connection with that infringement makes him/her unfit to be concerned in the management of a company, he/she may face being disqualified from being a director under a CDO for a period of up to 15 years. During this period, it is a criminal offence to act as a company director, act as a receiver of a company's property, or in any way, 'whether directly or indirectly, be concerned or take part in the promotion, formation or management of a company', or act as an insolvency practitioner (OFT, 2010a).

Leniency policy

A.26 Leniency programmes encourage cartel participants to identify themselves and the cartel to the authorities and provide information about the cartel to competition authorities. In return for the information, UK business may receive total or partial immunity from fines that the OFT could apply for infringements of the Competition Act and/or Article

101. Total immunity is available for the first member of a cartel who comes forward with relevant information (and also meets other conditions). Reductions in penalty of up to 50 per cent are also available in other circumstances.⁴⁴

A.27 The EU competition authority also has a leniency programme which was introduced in 1996 and a UK leniency programme was introduced in 1998. The EU-wide leniency programme offers generous fine reductions to firms which co-operate with an antitrust authority before an inquiry is opened and limited reductions can also be granted if cooperation occurs after the opening of a case (London Economics, 2009).

Early resolution

A.28 An early resolution agreement is a negotiated confidential settlement in which the parties agree the level of fine, which is substantially reduced, in return for co-operation with the investigation and an admission of liability (Mitchell, 2008).

Short-form opinions (SFOs)

A.29 The short-form opinion process is designed to provide guidance to businesses and their advisors on the application of competition law where there is an interest in issuing clarification for the benefit of a wider audience. (OFT Short-Form Opinions).

A.30 It is only available in a limited number of cases each year and therefore may be used for requests which meet all of the following conditions:

- Guidance is requested on novel or unresolved questions about the application of Article 101 of the Treaty on the Functioning of the European Union (TFEU) and/or prohibition in section 2 of the Competition Act 1998 (CA98), clarification of which would benefit a wider audience;

⁴⁴ www.ofc.gov.uk/OFTwork/competition-act-and-cartels/cartels/confess

- The request relates to a prospective agreement – as aimed at facilitating agreements to go ahead where possible under competition law, rather than commenting on agreements that would have gone ahead anyway.
- The request relates to a horizontal agreement between competitors – as the OFT recognises that these types of agreements typically raise more significant competition law concerns that may discourage the parties from taking part in the agreement.
- The proposed agreement has a material link to the UK.
- The parties involved in the proposed agreement are prepared to provide a joint statement of facts on which the Short-form Opinion is based and to allow it to be published for benefit of a wider audience.

A.31 A simple, short and flexible process is aimed at resulting in a published SFO within two or three months. The opinion is based on the statements of facts provided by the involved parties which are not verified for accuracy or completeness by the OFT.

A.32 In the process, the OFT will provide guidance in response to specific questions asked by the requesting parties to identify whether their behaviour is within the bounds of Competition Law. However, the SFO does not prejudge the answer on the same issue by the EC, European Court or the Competition Appeal Tribunal, nor does it bind national competition authorities.

A.33 The OFT published the first (and so far only) SFO in 2010 on joint purchasing agreements.⁴⁵

⁴⁵ www.of.gov.uk/OFTwork/competition-act-and-cartels/short-form-opinions/

Roles and responsibilities in UK competition enforcement cases

The respective roles of the OFT and the CC in merger control

- A.34 The function of the OFT in merger situations is to obtain and review information and it has a duty to refer to the CC, for further assessment, any merger situation that it believes may have resulted in a substantial lessening of competition in the UK market. It must also alert the Secretary of State to any mergers that it is investigating and believes raise material public interest considerations.
- A.35 In anticipated or completed mergers, the OFT can negotiate undertakings in lieu of a reference to the CC. The OFT may also contact other government departments, sectoral regulators, industry associations and consumer bodies for their views on merger cases (OFT, 2009).
- A.36 The CC is an independent body made up of experts in matters of competition. It investigates mergers referred to it to determine whether there is a merger situation that qualifies for investigation and, if so, whether that merger situation has resulted, or may be expected to result, in a substantial lessening of competition. The CC can only investigate merger cases which are referred to it, either by the OFT or by the Secretary of State under the public interest regime.

The role of the EU in Competition Law enforcement in the UK

- A.37 Where an agreement or conduct infringes Articles 101 or 102 TFEU, the European Commission may also have enforcement powers (see Regulation 1/2003). In cartel cases, if the cartel covers more than three EU Member States, the EC may take over the case. However, the OFT would still have an opportunity to comment on any decision the EC proposes to take (OFT, 2005). Furthermore, even a cartel in one Member State may have a 'community dimension' and be considered by the EC.
- A.38 The EC examines mergers of businesses with EU or global turnover above a certain size, including those that may have an impact in the UK. Mergers that have their main impact in the UK can be transferred to UK

Authorities for examination, and some mergers that do not meet the EC's thresholds may nonetheless be transferred to it by the merging businesses or the OFT (OFT, 2011b).

B METHODOLOGY

B.1 This annex provides further details of the selected methodology for the primary data collection and the sampling approach adopted. The study combines a number of different sources of information. First, a review of previous studies in the area was undertaken. Secondly, information was collected through:

- **A business survey:** The survey investigated company perspectives on the effectiveness of enforcement activities, awareness of activities and enforcement instruments, the relative effectiveness of different approaches, drivers of compliance, compliance procedures in place, etc. In addition, respondents were asked to assess behavioural impacts of a number of interventions. A total of 1,000 completed responses from businesses were obtained.
- **A behavioural experiment with firm representatives.** An online experiment was used to examine drivers of non-compliance and the effectiveness of different approaches to securing compliance. The online experiment was conducted with a sample of competition compliance officers that completed the business survey and agreed to participate in a six-minute follow-up experiment. The objective of the experiment was to explore deterrence effects on compliance officers' behaviour when they are (i) faced with different fine levels (including doubling the absolute fine); (ii) different probabilities of detection/incurred a fine; and (iii) the effect on behaviour when their decision can create third-party consumer harm. A total of 93 business representatives completed the behavioural experiment.
- **Consultations with business stakeholders.** examined similar issues as the business survey but involved a smaller number of stakeholders and were structured as open discussions. The consultations with business stakeholders were also used to inform the questionnaire design. A total of nine stakeholder organisations were approached, seven declined and two participated.

- **Consultations of legal professionals.** examined similar issues as the business survey but from the point of competition lawyers. A total of 27 telephone interviews were completed.

Business survey

B.2 The design of the telephone survey, the script and the sampling frame were agreed with OFT. The business survey was conducted by OMB Research and Table B.1 summarises the field work and piloting dates for the business survey. In addition to the main field work, a booster sample of large companies was surveyed.

Table B.1 Pilot and field work dates for the business survey

Pilots	March/April 2011
Main fieldwork	12 May - 7 July
Boost fieldwork	20 July - 3 August

B.3 The selected sampling frame for the business survey was set up to ensure the highest possible level of comparability between the current study and Deloitte (2007). Deloitte (2007) only surveyed companies with 200 employees or more. Therefore, for the purpose of this report, large companies were defined as companies with 200 employees or more. Small companies are defined as companies with less than 200 employees. This implies that the results for large companies are more comparable to the results obtained by Deloitte (2007) than the results for small companies. It is also worth noting that the selected sampling frame ensures a larger number of responses from large companies than that obtained by Deloitte (2007). As a result we would expect less sampling uncertainty in the results for large companies in our study.

B.4 The selected sampling frame also includes small businesses but it should be noted that large businesses are significantly oversampled in the survey, in order to allow for a comparison with Deloitte (2007). The results for small businesses are therefore subject to greater sampling uncertainty and should therefore be interpreted with greater care than

the results for large businesses. The results, nevertheless, give an indication of the views and behaviour of small businesses in the UK.

B.5 Throughout the report, results are presented separately for small and large businesses. Results are not provided for UK businesses overall. This is because the selected sampling strategy does not ensure a representative sample and due to the significant oversampling of large companies very large weights would need to be applied to the results to obtain results that are representative of the UK business population as a whole. This would involve considerable risk of bias from outliers and would lead to relatively uncertain estimates.

B.6 In addition to business size, the sampling frame also aimed at ensuring comparisons between businesses affected by different types of investigations:

- abuse of dominance
- cartels, and
- other potentially anti-competitive agreements.

B.7 Therefore, sampling targets were set for sectors with these types of investigations. For this purpose, a list of sectors with investigations was compiled but for legal reasons certain sectors with ongoing investigations or appeals were excluded.

B.8 Businesses from these latter sectors have not been included in the sample, nor do we directly ask questions about interventions in these sectors in the questionnaire. The sectors excluded for legal reasons are:

- construction (SIC2007 41, 42 and 43)
- retail sale in non-specialised stores (SIC2007 47.1)
- manufacture of dairy products (SIC2007 10.5)

- activities auxiliary to financial services, except insurance and pension funding (SIC2007 66.1)
- employment activities (SIC2007 78), and
- passenger air transport (SIC2007 51.1).

B.9 For sampling purposes, the sectors listed in Table B.2 were defined as sectors with different types of competition law interventions and business respondents were sampled from these sectors and other sectors (except those that were excluded for legal reasons).

Table B.2 Definition of sectors with competition law interventions for sampling purposes

SIC 2007 code	SIC 2007 Name	Cartels	Abuses	Commercial agreements
17	Manufacture of paper and paper products	Yes		
18	Printing and reproduction of recorded media	Yes		
20	Manufacture of chemicals and chemical products	Yes		
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations		Yes	
23	Manufacture of other non-metallic mineral products	Yes		
25	Manufacture of fabricated metal products, except machinery and equipment	Yes		
32	Other manufacturing	Yes		
46.4	Wholesale of household goods	Yes		
46.7	Other specialised wholesale		Yes	
47.7	Retail sale of other goods in specialised stores	Yes		
47.9	Retail trade not in stores, stalls or markets	Yes		
49.3	Other passenger land transport		Yes	
51.7 (SIC 1992)	Other wholesale	Yes		
58.1	Publishing of books, periodicals and other publishing activities		Yes	
60	Programming and broadcasting activities		Yes	Yes
61	Telecommunications		Yes	
62	Computer programming, consultancy and related activities		Yes	

64	Financial service activities, except insurance and pension funding	Yes	Yes	Yes
65	Insurance, reinsurance and pension funding, except compulsory social security			Yes
66.2	Activities auxiliary to insurance and pension funding			Yes
73.1	Advertising			Yes
74	Other professional, scientific and technical activities		Yes	
85	Education	Yes		
86.2	Medical and dental practice activities	Yes		
87	Residential care activities		Yes	
94	Activities of membership organisations	Yes		
96.03	Funeral and related activities		Yes	

Source: OMB Research

B.10 Table B.3 shows the target sampling frame for the business survey. It is worth noting that a booster sample of large companies was surveyed after the main fieldwork was completed. Including the booster sample, the target was to achieve 500 responses from large companies and 300 responses from small companies. These responses were to be split evenly between sectors with and without competition law interventions.

Table B.3: Sampling frame targets for business survey

Main Survey		Target number of interviews				
		0-9 emps	10-49 emps	50-199 emps	200+ emps	Total
Sectors without interventions	Total	38	37	75	200	350
Sectors with interventions	Total	37	38	75	200	350
	- <i>Cartels</i>	13	12	25	78	128
	- <i>Abuses</i>	12	13	25	78	128
	- <i>Commercial agreements</i>	12	13	25	44	94
TOTAL		75	75	150	400	700

Boost Survey		Target number of interviews				
		0-9 emps	10-49 emps	50-199 emps	200+ emps	Total
Sectors without interventions	Total	-	-	-	50	50
Sectors with interventions	Total	-	-	-	50	50
	- <i>Cartels</i>	-	-	-	17	17
	- <i>Abuses</i>	-	-	-	17	17
	- <i>Commercial agreements</i>	-	-	-	16	16
TOTAL		-	-	-	100	100

Main & Boost (combined)		Target number of interviews				
		0-9 emps	10-49 emps	50-199 emps	200+ emps	Total
Sectors without interventions	Total	38	37	75	250	400
Sectors with interventions	Total	37	38	75	250	400
	- <i>Cartels</i>	13	12	25	95	145
	- <i>Abuses</i>	12	13	25	95	145
	- <i>Commercial agreements</i>	12	13	25	60	110
TOTAL		75	75	150	500	800

Source: OMB Research

B.11 It is worth noting that no targets were set for sectors with and without mergers because so many sectors have been affected by merger investigations that no targets were required.

B.12 Table B.4 summarises the characteristics of the sample using the same definitions as in B.3 and shows that all targets were achieved (although slightly more responses were achieved in sectors with interventions and for large businesses).

Table B.4: Achieved sample for business survey

Main Survey		Interviews completed				
		0-9 emps	10-49 emps	50-199 emps	200+ emps	Total
Sectors without interventions	Total	38	37	75	200	350
Sectors with interventions	Total	41	38	79	200	358
	- <i>Cartels</i>	14	12	26	66	118
	- <i>Abuses</i>	12	13	26	78	129
	- <i>Commercial agreements</i>	15	13	27	56	111
TOTAL		79	75	154	400	708

Boost Survey		Interviews completed				
		0-9 emps	10-49 emps	50-199 emps	200+ emps	Total
Sectors without interventions	Total	-	-	-	50	50
Sectors with interventions	Total	-	-	-	50	50
	- <i>Cartels</i>	-	-	-	17	17
	- <i>Abuses</i>	-	-	-	17	17
	- <i>Commercial agreements</i>	-	-	-	17	17
TOTAL		-	-	-	101	101

Main & Boost (combined)		Interviews completed				
		0-9 emps	10-49 emps	50-199 emps	200+ emps	Total
Sectors without interventions	Total	38	37	75	250	400
Sectors with interventions	Total	41	38	79	250	408
	- <i>Cartels</i>	14	12	26	83	135
	- <i>Abuses</i>	12	13	26	95	146
	- <i>Commercial agreements</i>	15	13	27	73	128
TOTAL		79	75	154	501	809

Source: OMB Research

B.13 Within the businesses sampled the survey was targeted at 'the owner/managing director or the person responsible for regulation or competition compliance'.

Behavioural experiment

B.14 At the end of the business survey, respondents were invited to participate in a small online survey containing the behavioural experiment. If respondents agreed, contact details were taken and they were subsequently emailed a link to the online survey.

- B.15 A total of 329 respondents to the business survey (41 per cent of the sample for the business survey) agreed to participate in the experiment and a total of 93 respondents completed the experiment.
- B.16 This sampling approach means that respondents to the behavioural experiment were also 'the owner/managing director or the person responsible for regulation or competition compliance' within the companies that participated. However, the sample cannot in general be considered representative of the UK business population because there may be non-random selection into the experiment.
- B.17 As is common in behavioural experiments, participants were incentivised. In this case through the opportunity to win the total amount they would earn in the three tasks each participant completed. Three winners were selected at random and given the total amount they had earned.
- B.18 Participants were also informed that their choices would impact the earnings of another real person (these were individuals from UCL's usual subject pool) and for each winner the other person would also receive real money. This was to simulate the potentially adverse effects on consumers of a cartel.
- B.19 Finally, respondents were informed that the other person would be making no choices that could impact earnings of them as survey participants.

Figure B.1: Instructions given to experiment participants

Instructions

Thank you for agreeing to participate in this experiment. Your responses are completely anonymous.

In this experiment, you make **three** decisions.

In each decision, there are two options: an **OPTION 1** and an **OPTION 2**. In your decision, you specify under what conditions you would choose each option.

As a participant in the experiment, you have the opportunity to win real money. How much money you can win depends on the choices you make in the three decisions.

Experiment winners are determined using a lucky dip. That is, three participants in the experiment will be drawn at random from all participants and they will be paid their earnings from one of their three decisions.

The choices you make influence in each decision the amount of money you can potentially receive. However, the choices you make also impact the potential earnings of another real person. This person is not a participant in the experiment and when they receive their earnings they will not be told anything about the experiment.

Your choices impact upon this other person, but this person does not make choices that impact upon you.

Decision 1 of 3

You can pick either **OPTION 1** or **OPTION 2**. **OPTION 1** guarantees you a certain amount of money. **OPTION 2** gives you the chance of winning extra **BONUS** money, but this is not guaranteed and the monetary value of this **BONUS** is unknown. You can choose to always pick **OPTION 1**, always pick **OPTION 2**, or only pick **OPTION 2** if the **BONUS** is above a certain value (which you decide).

Source: Behavioural experiment, UCL.

Legal survey

B.20 The design of the telephone survey, the script and a list of contacts were agreed by London Economics and the OFT. The survey was

conducted by London Economics between 1 June 2011 and 20 July 2011.

- B.21 Using the Global Competition Review's 'Who is Who' guide and a web-sweep a total of 129 UK competition lawyers were identified. However, 33 competition lawyers were excluded from the list for legal reasons because they were involved in ongoing investigations or appeals.
- B.22 A total of 96 legal professionals were contacted for the study and 27 telephone interviews were completed with respondents who 'Since January 2003, [had] personally advised clients on the following competition law matters over which the OFT would have jurisdiction?
- Cartels
 - Anti-competitive agreements other than cartels
 - Abuse of dominance
 - Mergers
- B.23 We note that due to the sampling approach used, the sample of lawyers **cannot** be considered representative of UK competition lawyers. In particular, we note that a number of large competition law firms were excluded for legal reasons and there may be issues with non-response bias (that is, the sample of respondents differ from the sample of non-respondents in a systematic way).
- B.24 We also note that the views of legal professionals should **not** be interpreted as being based on observations of a representative sample of UK businesses. There is evidence that the legal professionals surveyed for the study mainly represent very large companies (with 500 employees or more) and this is also consistent with the finding from the business survey that large companies are most likely to seek external advice.

C CURRENT AND CLOSED OFT COMPETITION CASES

C.1 This list of cases has been compiled from the OFT website and only cases which are predominantly based in the UK have been included. For example, the Marine Hose cartel case which was an EC cartel investigation but led to criminal investigations in the UK has not been included. We have chosen this approach in order to obtain more conservative estimates of the effectiveness of OFT investigations.

Current cases

Cartels					
Year	Sic-2007 code	Name of sector	Name of intervention	Competition concerns	Status
2011	51.1	Passenger air transport	Airline passenger fuel surcharges for long-haul passenger flights	Early resolution agreement with one party	OFT expect to issue a Statement of Objections in the first half of 2011
2011	46.49	Sports goods retail sector	Investigation into sports goods retail sector	Alleged anti-competitive conduct	Investigation at an early stage
2011	29.10	Manufacture of motor vehicles	Investigation into commercial vehicle manufacturers	Suspected cartel activity	Investigation at an early stage
2011	58.11	e-books	Sale of e-books	Arrangements between certain publishers and retailers for the sale of e-books may breach competition laws	Investigation at early stage, parties involved should not be assumed to have been involved.

Commercial Agreements					
Year	Sic-2007 code	Name of sector	Name of intervention	Competition concerns	Status
2011	47.11, 10.51	Retail sale in non-specialised stores with food, beverages or tobacco predominating, Operation of dairies and cheese making	Dairy / Supermarkets	Infringement	OFT considering Tesco's representations and evidence, expect to conclude work in first half of 2011
2011	66.19	Other activities auxiliary to financial services, except insurance and pension funding	Investigation into interchange fees	-	Awaiting judgement of the European General Court
2011	79.90	Hotel online booking	Investigation into suspected breaches of competition law within hotel online booking sector	Suspected breaches of competition law	OFT is continuing with its formal investigation
2011	73.11	Outdoor advertising	Competition investigation into contracts entered into by media owners and local authorities	Concerns over long duration and potentially restrictive clauses of contracts which may restrict competition	Investigation at a very early stage.
2011	51.10	Passenger services	Investigation into alleged infringement of Chapter I and Article 101 in relation to passenger services on the London to Hong Kong route	Cathay Pacific Airways and Virgin Atlantic have allegedly infringed competition law in relation to passenger services	Receipt and consideration of any written and oral representations (expected in second quarter of financial year

					2010/2011).
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Abuse of dominance					
Year	Sic-2007 code	Name of sector	Name of intervention	Competition concerns	Status
2011	46.71	Bunker fuel provision	Bunker fuels	Alleged breach of Chapter II of Competition Act 1998 and Article 102 of the Treaty on the Functioning of the European Union by CH Jones Limited trading as 'Keyfuels'	Investigation on-going
2011	75.00	Veterinary diagnostics	Investigation into the veterinary diagnostics sector	Suspected breaches of competition law	Investigation on-going
2011	21.10	NHS Supply	Investigation into the alleged abuse of a dominant position by Reckitt Benckiser	Abused its dominant position in the market for the NHS supply of alginate and antacid heartburn medicines	Imposed a penalty of £10.2 million on Reckitt Benckiser

Closed cases

Cartels				
Year	Sic-2007 code	Name of sector	Name of intervention	Outcome
2011	64.19/1	Banks	Loan Pricing Case (RBS, Barclays)	Infringement
2009	78.10	Activities of employment placement agencies	Construction Recruitment Forum	Infringement
2009	41	Construction of buildings	Bid rigging in the construction industry in England	Infringement
2006	85.31	General secondary education	Schools: exchange of information on future fees	Infringement

2006	23.11, 46.90, 25.62	Manufacture of flat glass, non-specialised wholesale trade, Machining	Aluminium spacer bars	Infringement
2006	18.12, 17.12, 47.78	Other printing, manufacture of paper and paperboard, other retail sale of new goods in specialised stores	Stock check pads	Infringement
2006	43.91, 41.20/1	Roofing activities, Construction of commercial buildings	Flat roof and car park surfacing contracts in England and Scotland	Infringement
2005	43.91	Roofing activities	Felt and single ply flat-roofing contracts in the North East of England	Infringement
2005	43.91	Roofing activities	Mastic asphalt flat-roofing contracts in Scotland	Infringement
2005	43.91	Roofing activities	Felt and single ply roofing contracts in Western-Central Scotland	Infringement
2004	43.91	Roofing activities	Flat-roofing contracts in the West Midlands	Infringement
2004	20.13, 46.90, 47.99, 43.34	Manufacture of other inorganic basic chemicals, Non-specialised wholesale trade, other retail sale not in stores, stalls or markets, painting and glazing	UOP Limited/UKae Limited/Thermoseal Supplies Limited/Double Quick	Infringement
2003	32.40	Manufacture of games and toys	Hasbro UK Limited / Argos Limited/ Littlewoods Limited	Infringement
2003	47.72, 47.71	Retail sale of footwear and leather goods in specialised stores, retail sale of clothing in specialised stores	Replica football kit price-fixing	Infringement
2003	86.21	General medical practice activities	Anaesthetists' Groups	Non-infringement
2003	46.44	Wholesale of china and glassware and cleaning materials	Lladró Commercial S.A.	Infringement

2003	47.76	Retail sale of flowers, plants, seeds, fertilisers, pet animals and pet food in specialised stores	Elite Greenhouses Limited	Non-infringement
2003	94.99	Activities of other membership organisations n. e. C.	Northern Ireland Livestock and Auctioneers' Association	Infringement

Anti-competitive agreements				
Year	Sic-2007 code	Name of sector	Name of intervention	Outcome
2010	47.1	Retail sale in non-specialised stores	Tobacco	Infringement
2005	66.19	Other activities auxiliary to financial services, except insurance and pension funding	MasterCard UK Members Forum Limited	Infringement
2004	73.11, 60.10, 60.20, 64.20	Advertising agencies, Radio broadcasting, television programming and broadcasting activities, activities of holding companies	Attheraces Holdings Limited	Infringement
2004	66.01/1	Life insurance, Non-life insurance	Association of British Insurers' General Terms of Agreement	Non-infringement
2004	67.20	Other activities auxiliary to insurance and pension funding	Pool Reinsurance Company Limited	Non-infringement

Abuse of dominance				
Year	Sic-2007 code	Name of sector	Name of intervention	Outcome
2011	21.20	Manufacture of pharmaceutical preparations	Gaviscon	Infringement
2010	51.1	Passenger air transport	Flybe	Non-infringement
2009	49.3	Other passenger land transport (bus transport)	Cardiff bus	Infringement

2006	22.12	Publishing of newspapers	Associated Newspapers Limited	Non-infringement
2006	64.99	Other financial intermediation not elsewhere classified	London Metal Exchange	Non-infringement
2004	43.29, 62.01	Other construction installation, computer programming activities	TM Property Services Limited/MacDonald Dettwiler (Hub) Limited/MacDonald Dettwiler (Channel)	Non-Infringement
2004	93.03	Funeral related services	Harwood Park Crematorium	Non-infringement
2004	60.21/2	Local buses	First Edinburgh/Lothian	Non-infringement
2003	85.31/2	Non-charitable social work activities with accommodation	BetterCare Group Limited/North & West Belfast Health and Social Services Trust	Non-infringement
2003	46.75, 74.81/9	Wholesale of chemical products, Photographic activities	E.I. du Pont de Nemours & Company and Op. Graphics (Holography) Limited	Non-infringement
2003	60.10, 61.90	Radio broadcasting, other telecommunications activities	Re-investigation of BSkyB decision dated 17 December 2002	Non-infringement
2003	21.10	Manufacture of basic pharmaceutical products	Genzyme Limited	Infringement

D SUPPORTING SECTORAL ANALYSIS

D.1 Detailed responses to the business survey by size and sector are provided in a stand-alone annex. However, for the purpose of the report, we have also done some additional sector analysis testing whether responses from businesses are significantly different in the following sectors:

- Sectors with one or more competition law (abuse of dominance, cartel and other commercial agreement) investigations since 2003 vs. sectors with no competition law investigation since 2003.
- Sectors with one or more merger investigation since 2003 vs. sectors with no merger investigation since 2003.

D.2 The results are summarised in the main report and this section contains some additional documentation. The documentation is ordered according to the same headings as those used in the main report:

- drivers of compliance
- knowledge about competition issues
- voluntary compliance measures, and
- effectiveness of the UK competition regime.

D.3 We note that significance testing have also been carried out for other questions than those included in this annex but that no statistically significant effects have been found unless the evidence is presented here or discussed in the main report.

Drivers of non-compliance

Table D.1: Likelihood of different factors leading to the risk of non-compliance with competition law (percentage of respondents believing the factor to be either very or quite likely)

	Sector with competition law investigation		Sector with merger investigation	
	Yes	No	Yes	No
Lack of management commitment to compliance (%)	79*	75*	77	78
Rogue employees (%)	66	64	64	68
Lack of knowledge about the law (%)	80	80	80	79
Impractical legal advice (%)	66	70	70**	63**
Competing compliance priorities (%)	50	52	52	49
Perceived negative impact on profits (%)	58*	63*	61	59

Source: Business survey.

*statistically significant at 10 percentage level of confidence

**statistically significant at five percentage level of confidence.

Knowledge about competition issues

Table D.2: Awareness of specific aspects of competition law (percentage of knowledgeable respondents)

	Sector with competition law investigation		Sector with merger investigation	
	Yes	No	Yes	No
Leniency policy (%)	33	31	34	27
Early resolution (%)	43	42	44	38
Commitments to stop or modify behaviour or to change business structures (%)	51	49	52	45
The respective roles of the OFT and the CC in merger	54	51	54	51

control (%)				
Short-form opinions (%)	20	20	21	18
'No grounds for action' and non-infringement decisions (%)	41	40	42	35

Source: Business survey. *statistically significant at 10 percentage level of confidence,
**statistically significant at five percentage level of confidence.

Voluntary compliance measures

Table D.3: Compliance measures used by businesses by sector (percentage of respondents)

	Sector with competition law investigation		Sector with merger investigation	
	Yes	No	Yes	No
Carry out competition risk assessments	29	30	29	31
Employ a dedicated competition compliance officer	10	9	9	10
Take external advice on competition law matters	51**	42**	48	44
Have a formal competition law code of conduct or compliance programme	27**	20**	24	23
Hold training for employees on competition issues	28*	23	26	25
Anything else	7	7	7	6
None of these	44	48	43**	54**
Don't know	2	4	3	3

Source: Business survey. *statistically significant at 10 per cent level of confidence,
**statistically significant at five per cent level of confidence.

Table D.4: The use of information sources to inform competition policy by sector (percentage of respondents)

	Sector with competition law investigation		Sector with merger investigation	
	Yes	No	Yes	No
Does your company ever refer to any external information to inform your competition compliance measures	43**	36**	40	38

Source: Business survey. *statistically significant at 10 per cent level of confidence, **statistically significant at 5 per cent level of confidence.

Table D.5: Information sources used to inform competition policy by sector (percentage of respondents)

	Sector with competition law investigation		Sector with merger investigation	
	Yes	No	Yes	No
General Press	24**	16**	22**	17**
Trade journals	24**	17**	22**	17**
The OFT website or guidance	29**	22**	25	26
The CC website or guidance	23**	18**	21	19
The EC website or guidance	14	14	13	17
Legal publications or journals	28**	22**	26	25
Anything else	23**	15**	20	17
None of these	0.5	0.3	0.5**	0
Don't know	0.7	1	0.8	1

Source: Business survey. *statistically significant at 10 per cent level of confidence, **statistically significant at five per cent level of confidence.

Effectiveness

Table D.6: Business perceptions of the effectiveness of different aspects of the UK competition regime in terms of preventing anti-competitive conduct by sector (percentage of respondents)

	Sector with competition law investigation		Sector with merger investigation	
	Yes	No	Yes	No
The UK competition regime as a whole	67	65	64**	72**
The regime's role in deterring cartels	64	63	62	66
The regime's role in deterring anti-competitive agreements other than cartels	65*	60*	62	63
The regime's role in deterring abuses of dominant position	62	59	60	63
The regime's role in deterring anti-competitive mergers	64	63	64	62
The merger control regime Phase 1	33	36	34	35
The merger control regime Phase 2	31	35	32	35
The use of 'No Ground for Action' and Non-infringement decisions	52	63	55	62
The use of short-form opinions tool	60	63	61	64

Source: Business survey. *statistically significant at 10 per cent level of confidence,

**statistically significant at five per cent level of confidence.

E OPEN-ENDED RESPONSES TO BUSINESS SURVEY

- E.1 This annex summarises open-ended responses to the business survey.
- E.2 As part of the business survey respondents were asked about their awareness of a number of specific cases. In addition to the prompted cases, respondents could mention other cases that they had heard about and the interviewer would then record the details. This annex summarises those responses.
- E.3 Only cases that could be clearly identified have been included. Some respondents referred more generally to cases involving energy, supermarkets or airlines and it was not always obvious if respondents referred to a specific case and, if so, which case they were referring to.
- E.4 The tables below also only include cases that were mentioned by at least 5 respondents and hence the most frequently mentioned cases. Discussions of the results are provided in the main text.

Table E.1: Awareness of other cartel cases

Case	Frequency
Airline passenger fuel surcharges for long-haul passenger flights	69
Bid rigging in the construction industry in England	21
Dairy/Supermarket	9
Anaesthetists' Groups	7
BskyB	7
Hasbro UK Limited / Argos Limited/ Littlewoods Limited	7
Construction recruitment forum	5
Marine Hose cartel	5
Washing powder price fixing	5

Source: Business survey. Number of firms that had heard of the case.

Table E.2: Awareness of other anti-competitive agreement cases

Case	Frequency
BskyB	7
Airline passenger fuel surcharges for long-haul passenger flights	5

Source: Business survey. Number of firms that have changed behaviour.

Table E.3: Awareness of other abuse of dominance cases

Case	Frequency
BskyB	11

Source: Business survey. Number of firms that have changed behaviour.

Table E.4: Awareness of other merger cases

Case	Frequency
BskyB	25
Heinz and HP	11
Cadburys and Kraft	6

Source: Business survey. Number of firms that have changed behaviour.

F. CALCULATING DETERRENCE RATIOS

F.1 The deterrence ratios are calculated using the following formula:

Equation F-1

$$\text{Ratio} = \left(\frac{\text{per cent of companies in sample who have changed behaviour} \times \text{total number of businesses in UK business population} \times \text{average number of times behaviour has been changed by each firm}}{\text{number of closed and current OFT interventions 2003-2011}} \right)$$

F.2 This annex presents the detailed calculation of the deterrence ratios and the calculation of the corresponding confidence intervals. This is first done for competition law case and then for merger cases.

Competition law cases

Deterrence ratios for competition law cases

F.3 The starting point is the survey results indicating the extent to which respondents have changed behaviour as a result of OFT competition law cases.

Table F.1: Deterrence of commercial law investigations 2003-11 as reported by companies

	Small (<200 employees)			Large (200+ employees)		
	Firms that changed behaviour		Average number of changes, given firm changed	Firms that changed behaviour		Average number of changes, given firm changed
	Number	% of small companies in sample		Number	% of large companies in sample	
Cartel	2	0.65%	1*	23	4.59%	1.36**
Commercial	2	0.65%	1	18	3.59%	1.1***
Abuse	0	0.00%	-	9	1.80%	1

Source: Business survey. Based on 308 responses from small firms and 501 responses from large companies. * Assume 1, as no numerical responses were given. ** Excluding an outlier response of 40. *** Excluding an outlier response of 20.

F.4 In order to arrive at an estimate of the deterrence ratio it is necessary to scale these numbers based on the size of the UK business population. We use BIS data on the number of UK enterprises in the whole economy.⁴⁶ We have chosen to use this data for two reasons:

- The data contains information on the number of firms with less than and more than 200 firms respectively. Most other data sources split the sample at 250 and use the usual definition of SMEs as companies with less than 250 employees. However, we wish to facilitate comparison with Deloitte (2007) and therefore use the 200 employee benchmark.
- The data contains both VAT registered companies and unregistered companies. Unregistered companies are potentially a significant share of small companies and should be taken into account.

F.5 However, we note that we would ideally have liked to exclude the sectors covered by the sectoral regulators but according to BIS it is not possible to disaggregate the data at such a detailed sectoral level because it contains unregistered businesses.

F.6 Data from BIS on the total number of UK enterprises is compared with our sample in Table F.2.

Table F.2: Size composition of business sample and business population

		Small (< 200 employees)	Large (200+ employees)	Total
Sample	Number	308	501	809
	%	38%	62%	100%
Population	Number	4,913,310	10,010	4,923,320
	Percentage	95%	5%	100%

Source: Business survey and BIS.

⁴⁶ Statistics taken from BIS 'SME Statistics for the UK and regions, 2009'

F.7 By applying the percentages in Table F.1 to the size of the business population in Table F.2, we arrive at an estimate of the number of companies that have been deterred by each type of intervention. Multiplying by the average number of times a firm has changed behaviour in Table F.1, we achieve an estimate of the number of deterred cases between 2003 and 2011.

Table F.3: Number of companies and cases deterred 2003-11

	Small (<200 employees)		Large (200+ employees)	
	Number of companies deterred	Number of cases	Number of companies deterred	Number of cases
Cartel	31,937	31,937	459	625
Commercial	31,937	31,937	359	395
Abuse	0	0	180	180

Source: London Economics analysis

F.8 Table F.4 shows the number of cases undertaken by the OFT since 2003. It includes both closed and current cases as both closed and current cases may have had a deterrent effect on businesses surveyed for this study.

Table F.4: Number of closed and current OFT cases 2003-11

	Total number of closed and current cases
Cartel	22
Commercial	10
Abuse	15

Source: OFT website. London Economics analysis. The table includes all cases regardless of the outcome of the case.

F.9 Deterrence ratios are calculated by dividing the total number of deterred cases in Table F.3 with the number of cases undertaken by the OFT in the same period in Table F.4. The deterrence ratios are provided in Table F.5.

Table F.5: Deterrence ratios 2003-11: Number of cases deterred for every OFT investigation

	Small (< 200 employees)	Large (200+ employees)
Cartel	1,452 (-544; 3447)	28 (16;41)
Commercial	3,194 (-1196; 7583)	40 (21;58)
Abuse	Cannot be calculated due to lack of observations	12 (4;20)

Source: Business survey. London Economics analysis. 95% confidence intervals are in brackets

Confidence intervals

F.10 Once the deterrence ratios are derived, the next stage is to calculate the variance of the deterrence ratio.

F.11 The deterrence ratio is essentially calculated as a linear transformation after first multiplying two random variables:

- per cent of companies in sample that have changed behaviour, and
- number of times behaviour has been changed by each firm.

F.12 These two variables are estimated based on the survey results and estimates of the standard deviation of each of these variables can easily be calculated based on the survey results.

F.13 The two other components in the deterrence ratio can be considered constants for the purpose of the calculation of the deterrence ratio. These are:

- total number of businesses in UK business population, and
- number of closed and current OFT interventions 2003-2011.

F.14 The variance in the deterrence ratio can thus be obtained by applying the following two standard formulas:⁴⁷

Equation F-2

$\text{Var}(X) = \text{Var}(ab) = [E(a)]^2 * \text{Var}(b) + [E(b)]^2 * \text{Var}(a) + \text{Var}(a) * \text{Var}(b)$
--

Equation F-3

$\text{Var}(\text{ratio}) = \text{Var}[cX] = c^2 \text{Var}[X] = c^2 \text{Var}(ab)$
--

F.15 In Equation F.2, 'a' refers to the percentage of firms that have changed behaviour and 'b' refers to the average number of occasions that they have changed their behaviour, given that they have changed their behaviour. 'X' denotes the random variable constructed by multiplying the two random variables 'a' and 'b'.

F.16 The first step to calculate the variance is to calculate the value for 'c' in Equation F-3. This is equal to the total number of firms in the business population, divided by the number of current and closed OFT cases that have been undertaken in the period between 2003 and 2011.

Table F.6: C = Total number of firms in the population divided by the number of OFT cases 2003-2011 (by firm size).

	Small (< 200 employees)	Large (200 + employees)
Cartel	223,332	455
Commercial	491,331	1,001
Abuse	327,554	667

Source: OFT website. London Economics analysis.

⁴⁷ Note that when applying Equation F.2 we implicitly assume independence of 'a' and 'b'. We believe that this assumption is reasonable given that there are very few observations for the average number of changes and the covariance is equal to zero in most cases.

- F.17 The other pieces of information required for calculating the variance were obtained from the business survey using Stata.
- F.18 We note that no numeric responses were given by small firms in response to the question of the number of occasions they had changed their behaviour in response to a cartel or abuse of dominance case in the business survey, so it is assumed that the average number of occasions that firms change their behaviour is 1.

Table F.7: Mean percentage of firms that have changed their behaviour, E(a).

	Small (<200 employees)				Large (200+ employees)			
	E(a) = % of firms that have changed behaviour	E(b) = average number of times firms have changed behaviour	$\sqrt{\text{Var}(a)}$	$\sqrt{\text{Var}(b)}$	E(a) = % of firms that have changed behaviour	E(b) = average number of times firms have changed behaviour	$\sqrt{\text{Var}(a)}$	$\sqrt{\text{Var}(b)}$
Cartel	0.65%	1 *	8.00%	0	4.59%	1.357	20.90%	0.63
Commercial	0.65%	1	8.00%	0	3.59%	1.1	18.60%	0.32
Abuse	-	1 *	-	0	1.80%	1	13.30%	0

Source: Business survey. London Economics analysis

- F.19 By inputting this information into the formula, the following variances for the deterrence are obtained.

Table F.8: Variance of the deterrence ratios, Var(ratio).

	Small (<200 employees)	Large (200+ employees)
Cartel	319,214,746	20,451
Commercial	1,544,999,370	45,535
Abuse	-	7,878

Source: Business survey. London Economics analysis

- F.20 In order to obtain confidence intervals, we now need to calculate the margin of error:

Equation F-4

$$ME(\text{ratio}) = \text{standard error}(\text{ratio}) * 1.96 = \sqrt{\text{Var}(\text{ratio})} * 1.96 / \sqrt{(\text{sample size})}$$

F.21 The inputs into this formula are straightforward to compute. We note that the sample size is the size of the business survey sample for the two sub-groups that is, small and large businesses. There were 308 small businesses and 501 large businesses in the sample.

F.22 It should also be noted that multiplying the standard error by 1.96 to obtain the margin of error we assume a normal distribution. This is a reasonable assumption because the sample is of considerable size.

Table F.9: Margin of error

	Small (< 200 employees)			Large (200+ employees)		
	$\sqrt{\text{Var}(\text{ratio})}$	SE(ratio) = $\sqrt{\text{Var}(\text{ratio})}/\sqrt{(\text{sample size})}$	ME(ratio) = SE(ratio) * 1.96	$\sqrt{\text{Var}(\text{ratio})}$	SE(ratio) = $\sqrt{\text{Var}(\text{ratio})}/\sqrt{(\text{sample size})}$	ME(ratio) = SE(ratio) * 1.96
Cartel	17,867	1,018	1,995	143	6	13
Commercial	39,306	2,240	4,390	213	10	19
Abuse	-	-	-	89	4	8

Source: Business survey. London Economics analysis

F.23 From this, we can work out the 95 per cent confidence intervals as the deterrence ratio +/- the margin of error.

Table F.10: 95 per cent Confidence Intervals

	Small (< 200 employees)	Large (200+ employees)
Cartel	[-544; 3447]	[16; 41]
Commercial	[-1196; 7583]	[21; 58]
Abuse	-	[4; 20]

Source: Business survey. London Economics analysis

G DETAILED BEHAVIOURAL EXPERIMENT DESIGN AND RESULTS

- G.1 In this annex we present the detailed experimental design and results.
- G.2 As previously stated in section 6, each participant could choose between two options, namely options 1 or 2 across nine different tasks. In each task for option 2, either the bonus or the fee was not specified. In Option 1 the pay-offs were certain. In tasks 1-6, the level of the bonus was not specified and for tasks 7-9 the level of the fee was not specified.

Table G.1: Tasks faced by participants

Group	Task	Bonus	Loss	Fee	Prob (p)
A	Task 1	?	£40	£60	1/3
B	Task 2	?	£40	£30	2/3
C	Task 3	?	£40	£120	1/3
A	Task 4	?	£80	£60	1/3
B	Task 5	?	£80	£30	2/3
C	Task 6	?	£80	£120	1/3
A	Task 7	£60	£40	?	1/3
B	Task 8	£60	£40	?	2/3
C	Task 9	£60	£80	?	1/3

- G.3 In behavioural experiments it is common to allow participants to undertake more than one task. This is in order to obtain more observations and to analyse any learning effects which may arise.
- G.4 Therefore each participant was randomly assigned to group A, B or C. Each group undertook three tasks as shown in Table G.2. For example Group A completed tasks 1, 4 and 7. There were a total of 93 participants and therefore a resulting 279 observations.

Table G.2: Tasks and respondents

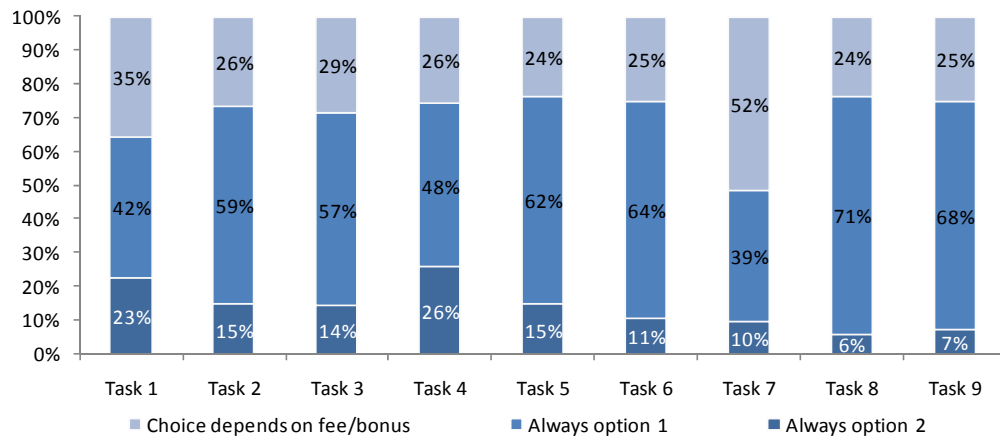
Respondent group	Tasks	Number of respondents
A	1, 4 and 7	31
B	2, 5 and 8	34
C	3, 6 and 9	28
	Total	93

Source: Behavioural experiment

Choice of alternative

G.5 Across the nine tasks, a very large share of participants selected 'always option 1' and hence the non-risky option. It is also worth noting that a number of participants selected 'always option 2' and hence always the risky cartel option.

Figure G.1: Observed choice of alternative



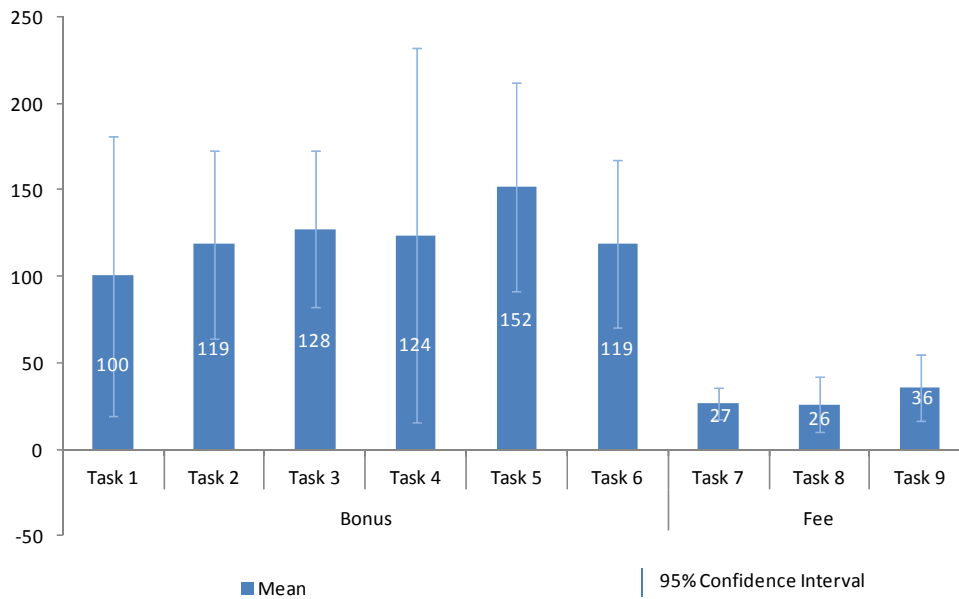
Source: Behavioural experiment

G.6 An explanation consistent with always choosing Option 1 no matter the level of the bonus or fee is a high level of risk aversion. Always choosing option 1 is also consistent with having social preferences, that is, not choosing the risky alternative because of the potentially adverse effects on other people. The results therefore suggest that there is a group of businesses that would never participate in cartel activity and compliance

for these people may be driven by a high level of risk aversion or social preferences. However, we note that this result should be treated with caution because participants may have been less likely to choose the risky outcome in a study run by the OFT than they would otherwise have been (that is, there is potential sponsor bias).

- G.7 Participants who always chose Option 2, no matter the level of the bonus or fee, can be viewed as being risk-loving. They always chose the risky option rather than the certain one. There are some risk-loving participants in the sample, but in each of the tasks, this is always the smallest share of participants. The fact that a small group of risk-loving participants were found in the sample suggests that there may be some businesses that would always be willing to participate in a cartel, regardless of the sanctions put in place. Hence some non-compliance may be explained by risk-loving attitudes.
- G.8 Across each of the tasks, there is a group of 24 per cent to 35 per cent of participants who say that the choice between Option 1 and 2 depends on the level of the bonus or fee. However, in Task 7, 52 per cent respond in this way.
- G.9 Participants who said that the choice depended on the fee or bonus level further specified the fee or bonus level they would require to choose Option 2 over Option 1. The average for each task and the 95 per cent confidence interval of each average are provided Figure G.2.

Figure G.2: Stated fee/bonus if choice between Option 1 and 2 depends on the fee/bonus



Source: Behavioural experiment. Using raw data.

What impacts behaviour?

G.10 As we have hinted above, there are many different factors that may impact behaviour. In this section, we consider the effect of:

- expected payoffs
- punishment
 - expected punishment
 - size of sanctions
 - likelihood of punishment, and
- social concerns.

G.11 For analytical purposes it would have been desirable if more participants had said that their choice depended on the fee/bonus. It would have allowed for a more straightforward analysis of the results. Our estimates of the average stated bonus and fee would have been more robust because they would have been based on a larger number of observations.

G.12 In order to make the most of the data, we analyse both:

- The estimates of the average bonus/fee required by those participants who actually stated a bonus/fee (that is,, not including respondents who said 'always option 1' or 'always option 2'). We refer to this as using raw data.
- The full dataset taking all responses into account by recoding 'always option 1' or 'always option 2' based on reasonable assumptions.⁴⁸ We refer to this as using recoded responses.

Expected payoffs

G.13 A risk neutral profit-maximising participant would be indifferent between Option 1 and Option 2 when the expected payoffs from the two options are equal. In other words, respondents would be indifferent between Options 1 and 2 if in the following case:

$$\begin{aligned} \text{Payoff Option 1} &= \text{Payoff Option 2} \text{ implying that} \\ \pounds 120 &= (1-p)(\pounds 120-B) + p(\pounds 120-F) \text{ implying that} \\ B &= p \cdot F / (1-p) \end{aligned}$$

⁴⁸ In order to include all responses in the analysis, we impute the fee/bonus in cases where this was not specified by the respondents. For those who 'always chose Option 1', a fee of 0 was set in tasks where the fee was missing and the bonus was set to 501 if missing (this corresponds to the maximum bonus stated plus one). For those who always chose Option 2, a fee of 501 was set in tasks where it was missing and the bonus was set at 0, where it was missing. For robustness, testing has also been done with other calibrations of the maximum fee/bonus. This analysis can be found in a stand-alone annex.

where F is the fee (given to or stated by participants)

B is the bonus (given to or stated by participants)

p is the probability of detection

- G.14 This means that the risk-neutral, profit-maximising participant would be expected to choose the fee or bonus such that the expected return from Option 2 (the cartel) exceeds the certain return from the Option 1 (non cartel activity). We note that a profit-maximising participant would not be concerned with the level of the loss to the other participant at all.
- G.15 Table G.3 shows the values of bonus or fee at which a risk-neutral, profit-maximising individual would be indifferent between choosing Option 1 or Option 2. It is worth noting that:
- if only expected payoffs matter, a bonus level of above the indifference values in tasks 1-6 should make the individual choose Option 2 and a value below these figures should make the individual choose Option 1
 - similarly, in tasks 7-9, a fee level below the indifference level should lead to a choice of Option 2 and a fee above these values would lead to a choice of Option 1 if only expected payoff mattered to participants.
- G.16 However, all but one of the averages of the stated values are very different from the indifference values. Stated bonuses were generally higher and stated fees lower than the risk-neutral outcome.
- G.17 This suggests that other aspects than expected payoff matter to participants. The results are again consistent with a significant level of risk aversion among participants, but, may also to some extent reflect that social concerns are a driver of compliance.

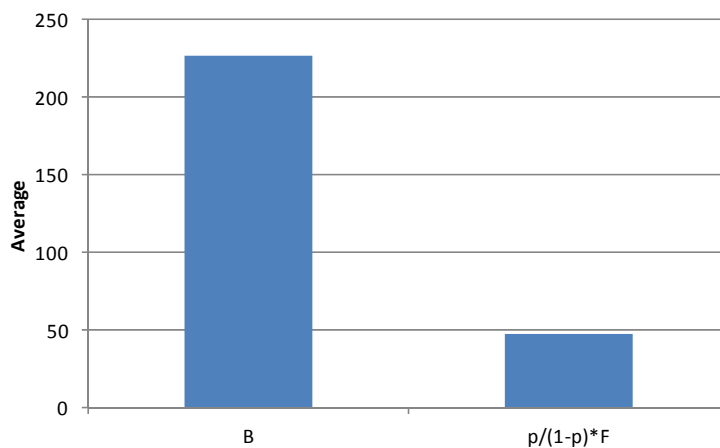
Table G.3: When choice depends on fee/bonus, do stated values indicate that only expected payoff matters?

		Indifference value: value at which risk neutral profit-maximising participants are indifferent between Option 1 and Option 2	Stated value: average stated fee or bonus by respondents who said choice depends on fee/bonus
Bonus	Task 1	£30	£100
	Task 2	£60	£119
	Task 3	£60	£128
	Task 4	£30	£124
	Task 5	£60	£152
	Task 6	£60	£119
Fee	Task 7	£120	£27
	Task 8	£30	£26
	Task 9	£120	£36

Source: Behavioural experiment. Based on raw data.

G.18 Statistically, the hypothesis that only the expected bonus matters is tested by using recoded data for all participants to analyse whether the responses reflect a case where participants are indifferent between the two options when the expected returns from the two options are equal. In particular we test whether $B = p * F / (1-p)$.

Figure G.3: Importance of expected payoff



Source: Behavioural experiment.

- G.19 On average the bonus required by participants is much larger than would be expected given the probability of detection and the fee as illustrated in Figure G.3. Non-parametric tests confirm this conclusion. Intuitively, this suggests that participants are not only concerned about their expected payoff when choosing between the risky and the non-risky alternative.

Punishment

- G.20 This section explores the impact of punishment on behaviour. First, we consider the impact of expected punishment and then we consider the effect of the size of sanctions and the likelihood of detection separately.

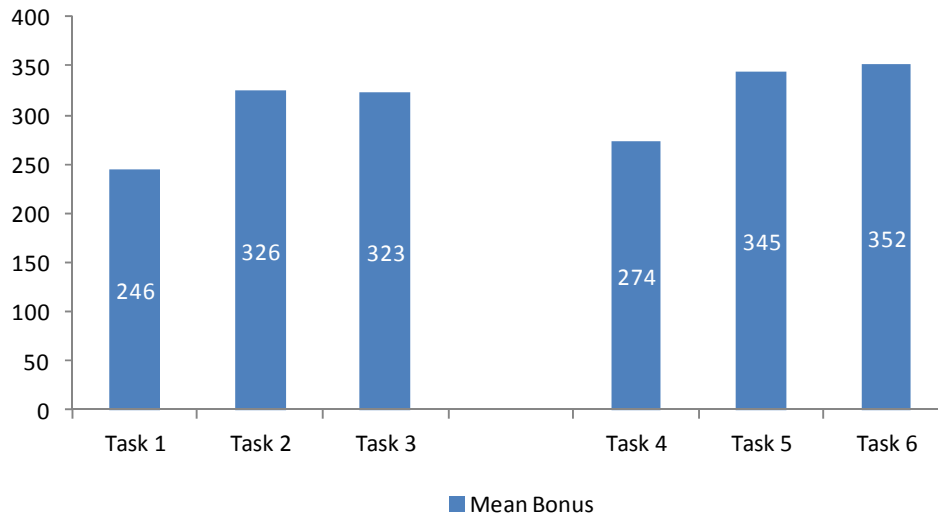
Expected punishment

- G.21 We would generally expect that respondents require a higher bonus if the expected punishment is very high. The expected punishment is defined as the probability of detection multiplied by the size of the sanction if detected (that is, $p \cdot F$).
- G.22 One way to analyse the actual impact of expected punishment in the experiment is to compare the bonuses required in Tasks 1 and 2 to the bonuses required in Task 3.
- G.23 Task 1 and 2 both have an expected punishment of £20 whereas Task 3 has an expected punishment of £40. All three tasks imply a loss of £40 for the other player. Therefore, if expected punishment is important for the choices made by participants, we would expect the bonus required in Task 3 to be higher than the required bonus in Tasks 1 and 2 in order to make up for the greater expected punishment.
- G.24 Similarly, Tasks 4 and 5 imply an expected punishment of £20 while Task 6 implies an expected punishment of £40. Tasks 4, 5 and 6 all imply a loss to the other person of £80. If expected punishment has an important effect on behaviour, we would expect the bonuses required in

task 6 to be higher than that required in task 4 and 5 to make up for the increased expected punishment.

G.25 As is illustrated in Figure G.4, this is not generally the case. Most notably, we do not find a marked difference between the bonuses required in tasks 2 and 3 and similarly in tasks 5 and 6.

Figure G.4: Importance of expected sanctions



Source: Behavioural experiment. Based on recoded responses.

G.26 However, there is a relatively large difference between task 1 and 3 as well as between tasks 4 and 6 (although not statistically significant). This suggests that the absolute size of the sanction (that is, the fee irrespective of the probability of detection, p) may be more important than the size of the expected sanction ($p \cdot F$).

Size of sanctions

G.27 To consider how participants respond to different sanctions, we can compare Task 3 with Task 1. We would expect that the average required bonus would be greater for Task 3 than that for Task 1 because the fee for Task 3 is £120, while it is only £60 for Task 1.

- G.28 Similarly, we would expect the average bonus required in Task 6 to be higher than the required bonus in Task 4. This is because the fee for Task 6 is £120 but it is only £60 in Task 4.
- G.29 As illustrated in Figure , the bonus in Task 3 does appear to be larger than in Task 1 and similarly for Task 4 and Task 6. But, the differences are not statistically significant.

Likelihood of punishment

- G.30 When looking at the raw data of stated bonuses, it is worth noting that the highest average bonus required for participants to choose the risky option was in Task 5 (Figure). This is one of the tasks that had a high probability of detection (two thirds vs. one third).
- G.31 Similarly, of Tasks 7-9 where respondents stated the fee level rather than the bonus, Task 8 implied the lowest average fee level using the raw data (Figure). Task 8 also had a relatively high probability of being caught.
- G.32 Statistically, the hypothesis that the likelihood of punishment is an important determinant of behaviour is tested by comparing the size of the required bonus in Tasks 1 and 3 with the size of the required bonus in Task 2. The loss to the other person is £40 in all three tasks but the likelihood of punishment is a third in Tasks 1 and 3 but two-thirds in Task 2. Based on non-parametric tests we cannot conclude that a higher likelihood of punishment is associated with a higher bonus. This may be because the fee also varies over the three tasks.
- G.33 A similar comparison for Tasks 4, 6 and 5 leads to the same results.

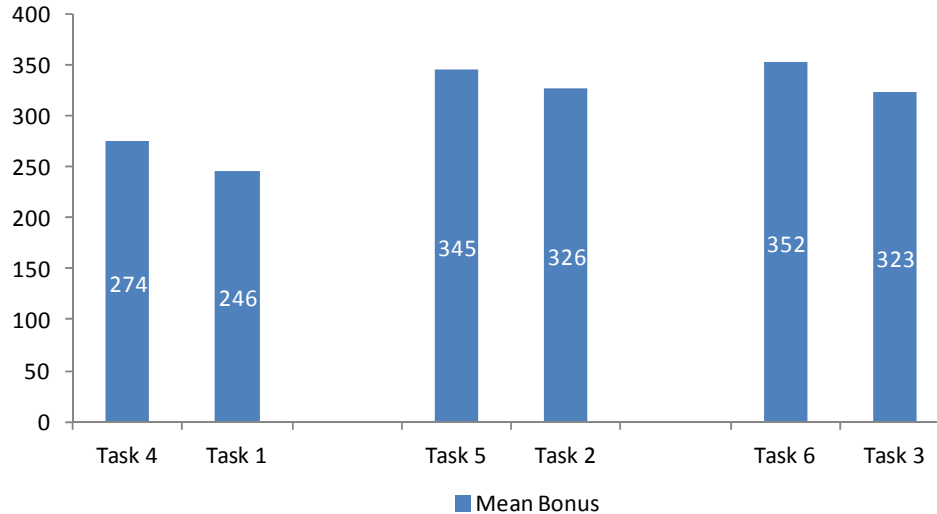
Social concerns

- G.34 Another interesting area to investigate is whether a higher level of loss to the other participant impacts the decision of the participant. The raw data shows that there is a relatively large difference between the mean bonus required for tasks 2 and 5 (£119 and £152 respectively), although the only difference between the two scenarios is the fact that

the loss value is higher in Task 5 than Task 2 (Figure G.5). Similarly, the average bonus required in tasks 1 and 4 are £100 and £124 respectively. The only difference between these two tasks is that the loss to the other player is £40 in task 1 and £80 in task 2.

- G.35 It therefore appears that participants, on average, require a higher bonus when inflicting a greater loss on the other player. However, the loss value should not affect the stated bonus if respondents care only about expected profits.
- G.36 It is also worth noting that these social preferences appear to be less strong when comparing the raw data results to Tasks 3 and 6. The mean bonuses required were £128 and £119, respectively, but the only difference between the two tasks was that the loss value was £40 in Task 3 and £80 in Task 6. Following the same logic as above, we would expect the mean bonus to have been higher in Task 6 than in Task 3.
- G.37 Statistically, the hypothesis that social concerns matter for behavioural choices is tested by comparing the recoded responses to:
- Task 4 and Task 1
 - Task 5 and Task 2, and
 - Task 6 and Task 3.
- G.38 In each of these cases, the only difference between the two tasks is that the loss value in one of the tasks is twice the value that it is in the other task.
- G.39 Therefore, if social preferences play a role in the decision of participants, we might expect that the mean bonus required would be higher in the task in which the loss value is higher. To test this theory we ran significance tests but found that, although the sign of the difference is as expected, none of the results are statistically significant.

Figure G.5: Social preferences



Source: Behavioural experiment. Based on recorded responses.

What are the most important factors influencing compliance?

- G.40 A regression model is used to analyse the relative importance of the fee, the probability of detection and social concerns in terms of explaining behaviour.
- G.41 In addition, the importance of a number of other observables (firm size, whether the sector has been affected by a competition intervention and whether the respondent is knowledgeable about competition law) has been tested.

Determinants of the stated bonus

- G.42 The marginal effects from a Tobit model of stated bonuses show that when the level of loss, fee and the probability of detection increase, participants require a higher bonus level in order to select the risky option. This is shown by the fact that the coefficients on each of these variables are positive.

- G.43 These results are as expected. If either the fee level or the probability of detection increases, the risk associated with Option 2 increases and to offset this, a higher bonus is required.
- G.44 The fact that the stated bonus is increasing in the loss to the other person again suggests a level of consideration towards the other participant. However, we note that this effect is statistically insignificant and hence less important in terms of deterring anti-competitive behaviour.

Table G.4: Stated Bonus – Tobit model, marginal effects

Variable	Marginal effect	p-value
Loss	1.7	0.303
Fee	5.3	0.088
Probability of detection	1279.1	0.072
Knowledge about competition law	-552.4	0.039

Source: London Economics based on behavioural experiment. Based on recoded responses

- G.45 The coefficient on the variable concerning whether the participant was knowledgeable about competition law is negative and statistically significant. This suggests that those knowledgeable of competition law would require a lower bonus to participate in a cartel than those not knowledgeable about competition law.
- G.46 We find that 47.5 per cent of participants that are knowledgeable of competition law chose option 2 compared to 17.9 per cent of participants that reported they were not knowledgeable. While of those that chose option 2 'depending on bonus/fee', 45 per cent were knowledgeable and 11 per cent were not knowledgeable.

G.47 This somewhat surprising result suggests that knowledge may not always be a driver of compliance. Instead a high level of knowledge may in fact be a sign of potential non-compliance.⁴⁹

Determinants of the stated fee

G.48 The marginal effects from the Tobit model on the stated fee yield similar results. The fact that the coefficient on the probability of detection is negative suggests that the higher the chance of detection, the lower the fee level must be for participants to choose Option 2 (the cartel).

G.49 There is also an indication that participants care about negative impacts on other people, as the negative coefficient on loss indicates that the higher the loss level, the lower the fee has to be for the participant to undertake the risky option. However, this effect is statistically insignificant.

G.50 There is also a tendency that participants from large companies require a lower fee (sanction). The coefficient on large is negative so participants from firms with 200 or more employees will undertake the risky option at a lower fee level than those from businesses with less than 200 employees.

G.51 Again the coefficient on the variable indicating whether the participant is knowledgeable about competition law has the opposite sign to that which we might have expected if knowledge is a driver of compliance. This suggests that being knowledgeable about competition law means that people require a higher fee to choose the risky option than those that are not knowledgeable.

⁴⁹ As stated previously (paragraph EG.6), participants that always chose option 2 no matter the level of the fee or bonus, can be viewed as being risk-loving. Further, we observe that of those that chose option 2 'depending on the level of fee/bonus' almost always stated bonuses that were higher and fees that were lower than the risk-neutral outcome (paragraphs EG.14 to G17.), meaning that participants who choose of option 2 'always' or 'depending on bonus or fee', have riskier preferences than risk neutrality.

Table G.5: Fee – Tobit model, marginal effects

Variable	Marginal effect	p-value
Loss	-3.4	0.157
Probability of detection	-505.4	0.062
Time taken	-0.0	0.001
Knowledge about competition law	281.3	0.038
Loss	-3.4	0.157

Source: London Economics based on behavioural experiment

G.52 Below we present further details and analysis of the results of the behavioural experiment. The following sections contain:

- tabulations of the responses to the behavioural experiment
- analysis of respondent characteristics
- analysis of response consistency
- hypothesis testing – what impacts behaviour? and
- regression results.

Tabulation of responses to behavioural experiment

G.53 This section contains basic tabulations of the results of the behavioural experiment

Table G.6: Choices between alternatives

Group		Choice depends on fee/bonus	Always option 1	Always option 2
A	Task 1	35%	42%	23%
B	Task 2	26%	59%	15%
C	Task 3	29%	57%	14%
A	Task 4	26%	48%	26%
B	Task 5	24%	62%	15%

C	Task 6	25%	64%	11%
A	Task 7	52%	39%	10%
B	Task 8	24%	71%	6%
C	Task 9	25%	68%	7%
	Total	82	158	39

Source: Behavioural Experiment. London Economics analysis

Table G.7: If respondent's choice was based on the fee or bonus, what was the fee or bonus they required?

Group		mean	se(mean)	sd	p50	min	max
A	Task 1	100.45	41.29	136.94	50	20	500
B	Task 2	118.56	27.77	83.31	100	40	300
C	Task 3	127.50	22.97	64.97	110	40	200
A	Task 4	123.75	55.35	156.56	90	20	500
B	Task 5	152.00	30.70	86.83	120.5	45	300
C	Task 6	118.71	24.62	65.13	140	1	200
A	Task 7	26.56	4.85	19.38	20	10	75
B	Task 8	25.88	8.11	22.93	20	1	60
C	Task 9	35.71	9.72	25.73	20	10	80
	Total	86.72	10.40	94.16	60	1	500

Source: Behavioural Experiment. London Economics analysis

Table G.8: Statistics for recoded answers

Group		mean	se(mean)	sd	p50	min	max
A	Task 1	246	43	237	100	0	501
B	Task 2	326	38	219	501	0	501
C	Task 3	323	41	216	501	0	501
A	Task 4	274	43	240	500	0	501
B	Task 5	345	36	210	501	0	501
C	Task 6	352	39	209	501	0	501
A	Task 7	62	26	147	10	0	501
B	Task 8	36	20	119	0	0	501
C	Task 9	45	25	130	0	0	501

Note: If option 1 always chosen fee set to 0 in questions where the fee is missing and the bonus set to 501 (max stated + 1) in questions where the bonus is missing. If option 2 always chosen fee set to 501 in questions where the fee is missing and the bonus set to 0 in questions where the bonus is missing. Source: Behavioural Experiment. London Economics analysis

Analysis of respondent characteristics

- G.54 The sample of respondents was drawn from the business survey sample. Respondents voluntarily selected into the survey and the results may therefore reflect the characteristics of the respondent who chose to complete the experiment.
- G.55 This section of the annex analyses respondent characteristics by linking the subject ID of people who completed the experiment with the respondent ID in the business survey. Business characteristics are constructed from the business survey.
- G.56 We note that there are relatively many large companies in the sample which is perhaps not so surprising given that about 62 per cent of respondents to the business survey were from large companies.
- G.57 There also seems to be a tendency that respondents with more knowledge about competition law and from sectors with competition law investigations since 2003 were more likely to select into the experiment. This could reflect a higher level of interest in competition issues and work undertaken by the OFT among these respondents.
- G.58 There is also a tendency that relatively many of the respondents are from companies with competition compliance processes in place.

Table G.9: Respondent characteristics

Characteristic	Percentage of respondents in experiment
Large company (200 employees or more)	68%
Knowledgeable about competition law	80%
Some kind competition compliance process used in company	67%
Business in sector with competition law investigation since 2003	62%
Business in sector with cartel investigation since 2003	29%

Source: Behavioural experiment and business survey.

G.59 Respondent characteristics may influence responses. Table G.9 provides basic univariate analyses of the relationship between the choice of alternative and the respondent characteristics.

G.60 There are a few notable patterns in the responses. First, small companies seem more likely to select 'always option 2', that is, the cartel option. Secondly, respondents without knowledge about competition law seem much more likely to choose the non-risky option, that is, 'always option 1', than respondents with some knowledge about competition law.

Table G.10: Respondent characteristics

Characteristic		Choice depends on fee/ bonus	Always Option 1	Always Option 2
Size	Small (< 200 employees)	27%	53%	20%
	Large (200+ employees)	31%	58%	11%
Knowledgeable about competition	No	10%	82%	8%
	Yes	33%	53%	15%

law				
Some kind competition compliance process used in company	No	25%	60%	15%
	Yes	30%	57%	13%
Business in sector with competition law investigation since 2003	No	29%	61%	10%
	Yes	30%	54%	16%
Business in sector with cartel investigation since 2003	No	26%	60%	14%
	Yes	37%	49%	14%

Source: Behavioural experiment and business survey.

Analysis of response consistency

G.61 This section analyses response consistency, that is, whether respondents do give consistent responses. If so we would expect that:

- If the bonus stated by respondents in group A in Task 1 is greater than £60 then the fee stated by the same respondent in Task 7 should be less than £60 (the fee in Task 1).
- If the bonus stated by respondents in group B in Task 2 is greater than £60 then the fee stated by the same respondent in Task 8 should be less than £30 (the fee in Task 2).
- If the bonus stated by respondents in group C in Task 3 is greater than £60 then the fee stated by the same respondent in Task 9 should be less than £120 (the fee in Task 3).

G.62 There was generally a high level of response consistency and across all participants 76 per cent provided consistent answers. It is highest in Group C, which has an 86 per cent consistency.

Table G.11: Does consistency depend on response type?

	A	B	C	Total
Consistent responses	68%	76%	86%	76%
Not –consistent responses	32%	24%	14%	24%
Total number of responses	31	34	28	93

Source: Behavioural Experiment. London Economics analysis

Hypothesis testing – what impacts behaviour?

G.63 This section provides non-parametric hypothesis testing. We use non-parametric tests because of the low number of observations and the fact that responses cannot be viewed as approximately normal because such a large share of respondents have chosen 'always Option 1' and 'always Option 2'.

G.64 We note that for the testing we use the pooled responses, that is, responses from all respondents regardless of whether they actually chose to state a bonus/fee or not.

G.65 In order to do this, a stated fee or bonus is coded for those who selected 'always Option 1' and 'always Option 2'.

- For those who **always chose Option 1:**
 - a fee of 0 was set in tasks where the fee was missing, and
 - the bonus was set to 501 if missing (this corresponds to the maximum bonus stated plus one). Alternatives were also tested.
- For those who **always chose Option 2:**
 - a fee of 501 was set in tasks where it was missing (alternatives were also tested), and

- the bonus was set at 0, where it was missing.

Table G.12: Significance test: Expected payoff

H0	HA	Coding of bonus if 'option 1 always' chosen and coding of fee if 'option 2 always' chosen	Test used	z	p > abs(z)	Conclusion (at 10% level of significance)
B = p/(1-p)*F	B different from p/(1-p)*F	200	Wilcoxon signed-rank test	11.373	0.0000	Reject H0
		300		11.050	0.0000	Reject H0
		501		11.019	0.0000	Reject H0
		1000		11.012	0.0000	Reject H0
		1000000		11.004	0.0000	Reject H0
		.		6.130	0.0000	Reject H0

Table G.13: Significance test: Expected punishment

H0	HA	Coding of bonus if 'option 1 always' chosen and coding of fee if 'option 2 always' chosen	Test used	z	p > abs(z)	Conclusion (at 10% level of significance)
pooled a1, b1 = c1	pooled a1, b1 different from c1	200	Mann-Whitney U test	0.94	0.3471	Cannot reject H0
		300		0.617	0.5371	Cannot reject H0
		501		0.832	0.4054	Cannot reject H0
		1000		0.832	0.4054	Cannot reject H0
		1000000		0.832	0.4054	Cannot reject H0
		.		0.907	0.3645	Cannot reject H0
pooled a2, b2 = c2	pooled a2, b2 different from c2	200	Mann-Whitney U test	0.585	0.5589	Cannot reject H0
		300		0.750	0.4532	Cannot reject H0
		501		0.998	0.3184	Cannot reject H0

		1000		0.998	0.3184	Cannot reject H0
		1000000		0.998	0.3184	Cannot reject H0
		.		0.851	0.3948	Cannot reject H0

Table G.14: Significance test: Size of punishment

H0	HA	Coding of bonus if 'option 1 always' chosen and coding of fee if 'option 2 always' chosen	Test used	z	p > abs(z)	Conclusion (at 10% level of significance)
a1 = c1	a1 different from c1	200	Mann-Whitney U test	-1.616	0.1068	Cannot reject H0
		300		-1.283	0.2084	Cannot reject H0
		501		-1.518	0.1291	Cannot reject H0
		1000		-1.518	0.1291	Cannot reject H0
		1000000		-1.518	0.1291	Cannot reject H0
		.		-1.197	0.2315	Cannot reject H0
a2 = c2	a2 different from c2	200	Mann-Whitney U test	-1.407	0.1595	Cannot reject H0
		300		-1.267	0.2053	Cannot reject H0
		501		-1.569	0.1167	Cannot reject H0
		1000		-1.596	0.1291	Cannot reject H0
		1000000		-1.518	0.1291	Cannot reject H0
		.		-1.344	0.1789	Cannot reject H0

Table G.15: Significance test: Likelihood of punishment

H0	HA	Coding of bonus if 'option 1 always' chosen and coding of fee if 'option 2 always' chosen	Test used	z	p > abs(z)	Conclusion (at 10% level of significance)
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pooled a1, c1 = b1	pooled a1, c1 different from b1	200	Mann- Whitney U test	0.962	0.336	Cannot reject H0
		300		0.954	0.3403	Cannot reject H0
		501		0.996	0.3192	Cannot reject H0
		1000		0.996	0.3192	Cannot reject H0
		1000000		0.996	0.3192	Cannot reject H0
		.		0.466	0.6413	Cannot reject H0
pooled a2, c2 = b2	pooled a2, c2 different from b2	200	Mann- Whitney U test	1.200	0.2303	Cannot reject H0
		300		0.692	0.4889	Cannot reject H0
		501		0.727	0.4670	Cannot reject H0
		1000		0.727	0.4670	Cannot reject H0
		1000000		0.727	0.4670	Cannot reject H0
		.		0.711	0.4771	Cannot reject H0

Table G.16: Significance test: Social concerns

H0	HA	Coding of bonus if 'option 1 always' chosen and coding of fee if 'option 2 always' chosen	Test used	z	p > abs(z)	Conclusion (at 10% level of significance)
a2 = a1	a2 different from a1	200	Wilcoxon signed-rank test	0.815	0.4151	Cannot reject H0
		300		0.815	0.4151	Cannot reject H0
		501		0.815	0.4151	Cannot reject H0
		1000		0.815	0.4151	Cannot reject H0
		1000000		0.815	0.4151	Cannot reject H0
		. (if both are 'always option 1')		0.812	0.4167	Cannot reject H0
b2 = b1	b2 different from b1	200	Wilcoxon signed-rank test	1.352	0.1762	Cannot reject H0
		300		0.705	0.4807	Cannot reject H0
		501		0.705	0.4807	Cannot reject H0
		1000		0.705	0.4807	Cannot reject H0
		1000000		0.705	0.4807	Cannot reject H0
		. (if both are 'always option 1')		0.697	0.4856	Cannot reject H0
c2 = c1	c2 different from c1	200	Wilcoxon signed-rank test	0.373	0.7092	Cannot reject H0
		300		0.373	0.7092	Cannot reject H0
		501		0.373	0.7092	Cannot reject H0
		1000		0.373	0.7092	Cannot reject H0
		1000000		0.373	0.7092	Cannot reject H0
		. (if both are 'always option 1')		0.428	0.6687	Cannot reject H0
pooled a2,b2,c2 = pooled a1,b1,c1	pooled a2,b2,c2 different from pooled a1,b1,c1	200	Wilcoxon signed-rank test	1.455	0.1457	Cannot reject H0
		300		1.072	0.2836	Cannot reject H0
		501		1.072	0.2836	Cannot reject H0
		1000		1.072	0.2836	Cannot reject H0
		1000000		1.072	0.2836	Cannot reject H0
		. (if both are 'always option 1')		1.098	0.2724	Cannot reject H0

Additional regression results

- G.66 This section contains additional regression results. The regression analysis is used to analyse determinants of the stated bonus and fee, respectively. We note that for the regressions we use the pooled responses, that is, the responses from all respondents regardless of whether they actually chose to state a bonus/fee or not.
- G.67 In order to do this a stated fee or bonus is coded for those who selected 'always Option 1' and 'always Option 2'.
- For those who **always chose Option 1**:
 - a fee of 0 was set in tasks where the fee was missing, and
 - the bonus was set to 501 if missing (this corresponds to the maximum bonus stated plus one).
 - For those who **always chose Option 2**:
 - a fee of 501 was set in tasks where it was missing, and
 - the bonus was set at 0, where it was missing.
- G.68 This coding of responses is what we will refer to as the 'standard coding of responses'. For robustness we also use alternative coding of the maximum, that is, 501.
- G.69 The regressions are undertaken using a Tobit model which allows the underlying distribution to be truncated from above and below. With the standard coding of responses we set the upper limit to 501 and the lower limit to 0. In all regressions, we cluster standard errors on subject ID. This is to account for individual specific effect that may impact standard errors in a non-random way.
- G.70 Below we present the following regression results for stated bonus and stated fee respectively:

- **Tobit regressions with standard coding of responses:** The analysis uses a general-to-specific approach to reach a parsimonious model. The full model contains explanatory variables related to the task (loss, fee and probability of detection), the experiment (sequence in which task was completed and time taken by respondent to complete the task) and the respondent (knowledge about competition law, business in sector with competition law investigation, business in sector with cartel investigation, size of the company, and use of compliance processes in the company). Eliminating the least significant variable at each step (but keeping task related variables in the regression at all times) we arrive at the reduced model. We term this the baseline model and colour code it gray.
- **Tobit regressions with alternative coding of responses:** These regressions use alternative coding of the maximum response that is, 501. We try the following alternatives: 200, 300, 1,000 and 1,000,000 and estimate the baseline model for each alternative level.
- **Tobit regression of stated bonus by knowledge:** The baseline model is run separately for the respondents who are knowledgeable about competition law and for respondents who are not classified as knowledgeable about competition law.
- **Tobit regression of stated bonus with no lower limit:** We test the impact of setting a lower limit by removing the lower limit.

G.71 It is worth noting that the sign of the effects found in the baseline model remain constant across all specifications, except when run only for respondents who are not knowledgeable about competition law. However, the magnitude of the effects is sensitive to the specification of the maximum value.

Table G.11: Tobit regression of stated bonus with standard coding

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7 (baseline)
Variable	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)
Loss	2.1 (0.224)	2.1 (0.224)	1.9 (0.269)	1.9 (0.269)	1.9 (0.272)	1.7 (0.296)	1.7 (0.303)
Fee	5.4 (0.119)	5.4 (0.113)	5.6 (0.07)	5.6 (0.068)	5.6 (0.068)	5.6 (0.068)	5.3 (0.088)
Probability of detection	1132.5 (0.162)	1120.5 (0.153)	1339.9 (0.058)	1341.1 (0.055)	1346.9 (0.055)	1362.4 (0.054)	1279.1 (0.072)
Sequence	27.7 (0.65)	27.3 (0.655)	44.8 (0.452)	44.8 (0.451)	47.0 (0.427)		
Time taken	0.0 (0.782)	0.0 (0.774)	0.0 (0.821)	0.0 (0.821)			
Large	35.8 (0.834)	35.6 (0.835)	1.8 (0.991)				
Knowledge about competition law	-494.7 (0.054)	-496.7 (0.056)	-559.6 (0.031)	-559.5 (0.031)	-562.2 (0.031)	-554.1 (0.034)	-552.4 (0.039)
Competition law investigation in sector	-21.1 (0.913)						
Cartel investigation in sector	-158.9 (0.428)	-170.0 (0.306)	-163.3 (0.304)	-163.7 (0.281)	-165.1 (0.276)	-170.1 (0.263)	
Compliance procedures in company	-31.2 (0.847)	-31.3 (0.847)					
Constant	-2.3 (0.997)	-0.8 (0.999)	-92.4 (0.867)	-91.8 (0.868)	-98.6 (0.859)	-10.8 (0.984)	-2.9 (0.996)
N	164	164	186	186	186	186	186
Prob>F	0.5154	0.4363	0.1947	0.1345	0.0878	0.0603	0.0885
Pseudo R2	0.0145	0.0144	0.0171	0.0171	0.0170	0.0165	0.0146
Lower limit	0	0	0	0	0	0	0
Upper limit	501	501	501	501	501	501	501

Note: Standard errors clustered on subject id, 32 left-censored observations at stated_bonus ≤ 0 in baseline, 51 uncensored observations and 103 right-censored observations at stated_bonus ≥ 501 in baseline.

Table G.12: Tobit regression of stated bonus with alternative coding

	Model 1 (always option 1 coded as 501)	Model 2 (always option 1 coded as 200)	Model 3 (always option 1 coded as 300)	Model 4 (always option 1 coded as 1000)	Model 5 (always option 1 coded as 1000)
Variable	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)
Loss	1.7 (0.303)	0.2 (0.257)	0.4 (0.239)	3.5 (0.306)	3692 (0.311)
Fee	5.3 (0.088)	0.7 (0.104)	1.13 (0.075)	11.0 (0.090)	11536 (0.094)
Probability of detection	1279.1 (0.072)	183.2 (0.105)	276.4 (0.069)	2642.0 (0.075)	2761584 (0.078)
Knowledge about competition law	-552.4 (0.039)	-58.1 (0.023)	-93.2 (0.007)	-1148.7 (0.042)	-1208010 (0.046)
Constant	-2.9 (0.996)	38.0 (0.640)	43.1 (0.701)	-56.7 (0.960)	-112247 (0.925)
N	186	186	186	186	186
Prob>F	0.0885	0.1104	0.0296	0.0962	0.1044
Pseudo R2	0.0146	0.0060	0.0068	0.0133	0.0078
Lower limit	0	0	0	0	0
Upper limit	501	non	non	1000	1000000

Note: Standard errors clustered on subject id.

Table G.13: Tobit regression of stated bonus by knowledge

	Model 1 (baseline)	Model 2 (knowledgeable)	Model 3 (not knowledgeable)
Variable	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)
Loss	1.7 (0.303)	1.8 (0.100)	-4.1 (0.297)
Fee	5.3 (0.088)	3.6 (0.054)	-2.5 (0.756)
Probability of detection	1279.1 (0.072)	861.4 (0.037)	-114.1 (0.955)
Knowledge about competition law	-552.4 (0.039)		
Constant	-2.9 (0.996)	-293.8 (0.315)	1435.7 (0.349)
N	186	160	26
Prob>F	0.0885	0.0585	0.7339
Pseudo R2	0.0146	0.0063	0.0051
Lower limit	0	0	0

Upper limit	501	501	501
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Note: Standard errors clustered on subject id

Table G.14: Tobit regression of stated bonus with no lower limit

	Model 1 (baseline)	Model 2 (no lower limit)
Variable	Coeff. (p-value)	Coeff. (p-value)
Loss	1.7 (0.303)	1.3 (0.224)
Fee	5.3 (0.088)	3.2 (0.084)
Probability of detection	1279.1 (0.072)	785.0 (0.055)
Knowledge about competition law	-552.4 (0.039)	-379.9 (0.021)
Constant	-2.9 (0.996)	185.0 (0.574)
N	186	186
Prob > F	0.0885	0.0371
Pseudo R2	0.0146	0.0119
Lower limit	non	non
Upper limit	501	501

Note: Standard errors clustered on subject id

Table G.15: Tobit regression of stated fee with standard coding of responses

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6 (baseline)
Variable	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)
Loss	-4.2 (0.149)	-3.1 (0.164)	-3.3 (0.162)	-3.1 (0.174)	-3.2 (0.164)	-3.4 (0.157)
Probability of detection	-531.4 (0.130)	-414.8 (0.112)	-445.0 (0.099)	-415.4 (0.100)	-428.1 (0.094)	-505.4 (0.062)
Sequence	37.3 (0.505)	44.2 (0.330)	37.2 (0.410)	35.0 (0.441)		
Time taken	-0.0 (0.002)	-0.0 (0.000)	-0.0 (0.000)	-0.0 (0.000)	-0.0 (0.000)	-0.0 (0.001)
Large	-175.3 (0.117)	-150.2 (0.090)	-137.0 (0.108)	-140.2 (0.094)	-139.1 (0.103)	
Knowledge about competition law	293.7 (0.037)	271.6 (0.028)	279.0 (0.027)	286.4 (0.024)	274.1 (0.030)	281.3 (0.038)
Competition law investigation in sector	119.7 (0.291)	90.2 (0.319)	55.4 (0.486)			
Cartel investigation in sector	-97.1 (0.344)	-75.1 (0.379)				
Compliance procedures in company	96.2 (0.344)					
Constant	2.3 (0.993)	-16.1 (0.936)	1.6 (0.994)	15.5 (0.941)	102.7 (0.597)	44.8 (0.816)
N	82	93	93	93	93	93
Prob > F	0.0781	0.0266	0.0264	0.0153	0.0140	0.0128
Pseudo R2	0.0345	0.0310	0.0269	0.0284	0.0271	0.0128
Lower limit	0	0	0	0	0	0
Upper limit	501	501	501	501	501	501

Note: Standard errors clustered on subject id, 55 left-censored observations at stated_bonus <= 0 in baseline, 31 uncensored observations and 7 right-censored observations at stated_bonus >= 501 in baseline.

Table G.16: Tobit regression of stated fee with alternative coding

	Model 1 (always option 2 coded as 501)	Model 2 (always option 2 coded as 200)	Model 3 (always option 2 coded as 300)	Model 4 (always option 2 coded as 1000)	Model 5 (always option 2 coded as 1000)
Variable	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)	Coeff. (p-value)
Loss	-3.4 (0.157)	-1.2 (0.121)	-1.7 (0.132)	-6.6 (0.164)	-6451.1 (0.171)
Probability of detection	-505.4 (0.062)	-184.1 (0.029)	-259.3 (0.038)	-979.2 (0.070)	-952643.8 (0.078)
Time taken	-0.0 (0.001)	-0.0 (0.000)	-0.0 (0.000)	-0.0 (0.001)	-1.4 (0.001)
Knowledge about competition law	281.3 (0.038)	101.4 (0.016)	144.6 (0.019)	548.0 (0.042)	535942.8 (0.045)
Constant	44.8 (0.816)	25.73 (0.694)	29.3 (0.759)	70.1 (0.854)	50894.0 (0.894)
N	93	93	93	93	93
Prob>F	0.0128	0.0000	0.0001	0.0164	0.0199
Pseudo R2	0.0128	0.0225	0.0202	0.0177	0.0097
Lower limit	0	0	0	0	0
Upper limit	501	non	non	1000	1000000

Note: Standard errors clustered on subject id.

Table G.17: Tobit regression of stated fee by knowledge

	Model 1 (baseline)	Model 2 (knowledgeable)	Model 3 (not knowledgeable)
Variable	Coeff. (p-value)	Coeff. (p-value)	No convergence
Loss	-3.4 (0.157)	-4.2 (0.105)	
Probability of detection	-505.4 (0.062)	-517.6 (0.077)	
Time taken	-0.0 (0.001)	-0.0 (0.001)	
Knowledge about competition law	281.3 (0.038)		
Constant	44.8 (0.816)	371.1 (0.087)	
N	93	80	
Prob>F	0.0128	0.0067	
Pseudo R2	0.0128	0.0118	
Lower limit	0	0	
Upper limit	501	501	501

Note: Standard errors clustered on subject id

Table G.18: Tobit regression of stated fee with no lower limit

	Model 1 (baseline)	Model 2 (no lower limit)
Variable	Coeff. (p-value)	Coeff. (p-value)
Loss	-3.4 (0.157)	-0.6 (0.550)
Probability of detection	-505.4 (0.062)	-93.0 (0.387)
Time taken	-0.0 (0.001)	-0.0 (0.060)
Knowledge about competition law	281.3 (0.038)	59.6 (0.004)
Constant	44.8 (0.816)	72.9 (0.393)
N	93	93
Prob>F	0.0128	0.0370
Pseudo R2	0.0128	0.0025
Lower limit	non	non
Upper limit	501	501

Note: Standard errors clustered on subject id.