AGGREGATES, CEMENT AND READY-MIX CONCRETE MARKET INVESTIGATION

Analysis of cost structures and profit margins

PART II: Assessment covering the Majors' Relevant GB Operations

Introduction

1. This paper sets out our assessment of cost structures and margins for the Majors' Relevant GB Operations. The methodology applied in this paper has been set out in a separate working paper titled 'Part I: Purpose, approach and methodology' (see Part I). Terms used in this paper are defined in a separate 'Glossary'.

2. This paper examines:

   (a) the consolidated margins for the Majors' combined Relevant GB Operations;

   (b) cost symmetry for their Cement Divisions at both divisional and site levels;

   (c) the Cement Divisions' margin performance and trends over the Relevant Period;

   (d) the difference in a Cement Division's profits generated from surrendering EU Emissions Trading System (ETS) carbon allowances to produce additional clinker, with the proceeds from selling carbon allowances on the market; and

   (e) the cost structures and margins of the Majors' Aggregates and RMX Divisions, including an assessment of how their underlying margins might be affected by differences in their average external and internal prices of aggregates.

3. A comparison of the Majors' cost structures and margins with those of the medium-tier independents is set out in the third part of this working paper (see Part III).

4. Whilst we requested the Majors to provide P&L data covering the period from FY05 to FY11, only one of the Majors was able to provide us with complete FY05 and FY06 P&L data, which were reliable and consistent with the P&L data covering the

Relevant Period. Given the significant concerns and issues raised by the other Majors in relation to their FY05 and FY06 P&L data, we focused our assessment on the Relevant Period, ie from FY07 to FY11.

Summary

5. We first set out a summary of this paper, followed by full details of our assessment of the Majors' cost structures and margins.

Consolidated margins

6. As set out in our methodology paper (see Part I), we calculated consolidated margins by dividing consolidated profit, the profit generated on both external and internal sales, by consolidated revenues, the sum of: *(a)* all external net revenues; and *(b)* all internal net revenues, but excluding those generated from internal sales to its RMX Division.

Consolidated variable profit margins

7. We found that consolidated variable profit margins for the cement-producing Majors exhibited resilient and stable margins during a period in which all of the reference markets experienced a significant downturn in volumes. Over the Relevant Period, the consolidated variable profit margins for [✂] of the cement-producing Majors, namely [✂], moved within a relatively tight range. [✂], however, was able to improve its consolidated variable profit margin significantly in FY09, in a year when the full-year effects of the market downturn would have been felt.[1] Between FY09 and FY11, [✂] was able to maintain a relatively constant consolidated variable profit margin.

8. Aggregate Industries, the only Major not to produce cement in GB, consolidated variable profit margin [✂] over the Relevant Period, [✂].

[1] Whilst the market downturn began towards the end of FY08, we have examined the impact of the downturn from FY09 onwards, when the full impact of the downturn would have been felt.

9. Based on our analysis, we found that the market downturn in FY09 did not have a negative impact on the consolidated variable profit margins of the four cement producing Majors, [✂], [✂] and [✂].[2]

Consolidated EBITDA margins

10. Consolidated EBITDA margins declined in FY09 for [✂], [✂], [✂] and [✂],[3] driven largely by adverse fixed costs, which, by their very nature, would not have been immediately responsive to the sharp downturn in demand seen in the reference markets. Only [✂] saw its consolidated EBITDA margin improve in FY09.

11. Over the Relevant Period, we found that [✂] consistently generated the highest consolidated EBITDA margin whilst [✂] consistently generated the lowest. Since FY09, however, consolidated EBITDA margins remained relatively stable for [✂], [✂], [✂] and [✂]. [✂] consolidated EBITDA margin, however, increased over the period from FY09 to FY11.

Divisional contribution to consolidated figures

12. In order to make a more meaningful comparison between the relative contributions of each division, we combined the contributions of each Major's Aggregates and RMX Divisions. Our reasons for doing so are set out in the main body of this paper.

13. We found that the Cement Division made a significant contribution to the consolidated EBITDA of Cemex (at [✂] per cent), Hanson (at [✂] per cent) and Lafarge (at [✂] per cent). However, in contrast, Tarmac's Cement Division accounted for just [✂] per cent of its consolidated EBITDA, with its combined Aggregates and RMX Division contributing [✂] per cent.

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[2] Whilst [✂] and [✂] also had hedging arrangements in place in relation to their power costs, the impact of [✂] hedging arrangement on consolidated margin was negligible, and [✂] was unable to estimate the profit impact of its hedging arrangement during the Relevant Period.

[3] As noted earlier, [✂] consolidated margin was not comparable with those of the other Majors.

14. Based on our analysis, we found that the Cement Division was the key driver of consolidated EBITDA for Cemex, Hanson and Lafarge, whilst the combined Aggregates and RMX Division was the key driver of Tarmac's consolidated EBITDA. Our analysis suggests that in this respect, there is a degree of alignment in the business incentives of Cemex, Hanson and Lafarge, whilst Tarmac's incentives may be different from those of the other cement-producing Majors.

Comparison of cost structures for the Majors' Cement Divisions

Similarities in variable costs

15. A comparison between the Majors showed that their Cement Divisions exhibited a large degree of symmetry in their unit variable costs. Among the cement producers, [✂] benefited from the lowest unit variable cost at £[✂] a tonne. Excluding [✂], the range for the unit variable cost of the remaining three cement producers considerably tightens, from £[✂] ([✂]) to £[✂] ([✂]) a tonne.

16. Based on our analysis and the comments from the cement-producing Majors, we considered that the unit variable costs of producing clinker would not only be similar for each of the cement-producing Majors, but would also be relatively transparent, or at least, could be estimated to a reasonable degree of accuracy from readily available public data, including information on each cement works' kiln type, manufacturing technology and plant capacity.

Similarities in fixed costs

17. Based on our analysis, whilst we found that unit fixed costs were similar for three of the cement-producing Majors, we considered that differences in each company's management, organizational and operational structure would reduce transparency in their fixed-cost structures. However, we also considered that there were certain elements within fixed costs which would lend themselves to improving cost structure

transparency, such as those costs related to the production process or to the plant itself, for example the costs of production staff and repairs and maintenance, such that these costs could be reasonably estimated by outside competitors.

The impact of hedging on variable cost symmetry and transparency

18. [✂], [✂] had hedging arrangements in place in relation to their power costs. We found that hedging arrangements were likely to reduce an element of transparency in relation to each Cement Division's actual variable costs.

The impact of the ETS on variable cost transparency

19. We found that based on the annual verified carbon emissions data for each ETS installation published by the European Commission each year, clinker production volumes could be estimated for each cement works. We considered that this would enable each cement-producing Major to estimate each of its competitors' shares of clinker production volumes. Based on a reasonable estimate of both unit variable cost and total clinker production volumes, we considered that a Cement Division's total variable costs could be estimated by its competitors to a reasonable degree of accuracy.

20. Whilst we attempted to examine cost structures at an individual cement works level, a more granular comparison of cost structures at an individual cement works level proved less feasible given the inclusion by certain Majors of non-clinker production sites within their site P&L data, for example depots, cement import terminals and blending stations. Notwithstanding these limitations, our analysis is set out in the main body of this paper.

Analysis of margins for the Majors' Cement Divisions

Trends in margins over the Relevant Period

21. We found that unlike the other cement producers, [✂] sales volumes consistently outperformed the market, with sales volumes increasing year-on-year since the end of FY08. Whilst [✂] sales volumes performed in line with the market, [✂] and [✂] saw steeper falls in their sales volumes on FY07 levels. Average prices have generally kept pace with, or increased at a faster pace than unit variable costs, resulting in variable profit margins being successfully maintained over the Relevant Period against a backdrop of declining market volumes and increasing costs. The performance of the Majors' Cement Divisions contrasts sharply with the performance of their respective Aggregates and RMX Divisions, which was generally characterized by margin erosion over the Relevant Period.

22. We found that for [✂] and [✂], their average external prices were broadly in line with their average internal prices. However, over the Relevant Period, average external prices exceeded average internal prices for [✂], and to a lesser extent, for [✂]. In relation to [✂], we considered that variations in its average external and internal prices were largely [✂]. In relation to [✂], we considered that average price variations between external and internal sales, were largely driven [✂].

23. Over the Relevant Period, we found that variable profit margins for the Majors' Cement Divisions remained relatively stable and resilient with margins moving within a relatively tight range. In particular, we found that the impact of the sharp downturn in market demand in FY09[4] did not have a negative impact on the cement-producing Majors' variable profit margins (on external sales only), with [✂], [✂] and [✂] all

[4] Whilst the market downturn began towards the end of FY08, we have examined the impact of the downturn from FY09 onwards, when the full impact of the downturn would have been felt.

experiencing increases in margins whilst [✂] margin remained broadly flat on prior year levels.

Sensitivity analyses

24. We conducted two sensitivity analyses on the margins of the Majors' Cement Divisions to examine the impact on margins of: *(a)* no power hedging arrangements; and *(b)* including in our profit calculations the proceeds from the sale of surplus ETS carbon allowances. We conducted our first sensitivity analysis on [✂] and [✂], where we found that hedging only had a significant impact on [✂] margins. In the absence of hedging, [✂] margin trends would have been much more closely aligned with the margin trends of the other cement-producing Majors, for example their margins increase in FY09 and decrease in FY10.

25. In relation to our second sensitivity analysis, the proceeds from the sale of surplus carbon allowances represented a significant enhancement on each Cement Division's margins, for example by up to [✂] percentage points for [✂] in FY08. However, given the volatility of these sale proceeds, we considered that their inclusion would not be meaningful for our purposes, namely identifying any underlying margin trends.

Comparison of profits from cement sales with the sale of carbon allowances

26. Based on our analysis comparing the EBITDA that could be generated from the surrender of one carbon allowance (ie in order to produce more clinker) with the price of a carbon allowance, we found that during ETS Phases I and II, it was generally more profitable to produce and sell cement than sell carbon allowances. Therefore, carbon allowances that were sold should represent a genuine surplus to requirements arising because a Major's Cement Division was either unable to produce (due to capacity constraints) or sell any more cement.

Assessment on the Aggregates and RMX Divisions

Aggregates Division—average external and internal price and margin trends

27. When we examined the average price on external and internal aggregates sales generated by the Majors, we found that internal transfer prices were generally higher than external prices. [✂] and [✂] both told us that this was the result of their transfer pricing policy whilst [✂] told us that they set their internal transfer prices with reference to market prices, and that one of the reasons for higher internal prices on average was product sales mix.

28. We controlled for an element of the effect of product sales mix by analysing the average external and internal prices on seven different product categories of primary aggregates based on the Majors' transactions data. We found that for the vast majority of product categories, average external prices were higher (in some cases, significantly higher) than average internal prices. We note, however, that this analysis did not control for other possible factors that might be relevant in pricing, for example the effects of sales volumes or geography. We therefore found that product sales mix was not likely to explain fully the differential between average external and internal prices.

29. Over the Relevant Period, all of the Majors' sales volumes broadly declined in line with the market, with perhaps the exception of [✂] in FY11, which suffered a sharper drop in sales volumes compared with the market and the other Majors. However, the Majors' average prices on external aggregates sales remained relatively stable, notwithstanding the substantial decline in market volumes during this period. We also

found that the market downturn in FY09[5] did not have a negative impact on the Majors' average prices.

30. Whilst we found that the downturn in market demand had a negative impact on the FY09 external variable profit margins of [✂] and [✂], margins increased for [✂] and [✂] and remained stable for [✂]. In relation to the FY09 margin performance of [✂] and [✂], since average prices were largely unaffected by the market downturn, their margin erosion can largely be explained by increases in their unit variable costs, which had outpaced changes in their average external price. Since FY09, however, variable profit margin performance has varied for each of the Majors, with margins declining year-on-year for [✂] and [✂], and margins remaining broadly stable for [✂], [✂] and [✂].

Cost structure assessment of the Aggregates Division

31. We found no evidence of symmetry in the cost structures of the Majors' Aggregates Divisions, with relatively large variations seen across the Majors. Given the relatively wide range of product categories for aggregates (eg crushed rock, sand and gravel and recycled aggregates) we partly controlled for this variation by examining cost structures at an aggregates site level. Based on our analysis, we found that there was limited symmetry in these sites' cost structures, even when we compared the cost structures of sites focused on the production and sale of one specific product category.

RMX Divisional cost structures and the impact of higher internal aggregates prices

32. Variable costs accounted for the highest proportion of an RMX Division's total costs, ranging from [✂] per cent (or £[✂] per cubic metre) for [✂], to [✂] per cent (or £[✂] per cubic metre) for [✂], and [✂] per cent (or £[✂] per cubic metre) for [✂]. In

[5] See footnote 1.

relation to [✂] and [✂] higher unit variable costs, we note that both [✂] and [✂] told us that prices of aggregates on sales to their downstream businesses (eg the RMX Division) were higher than on their like-for-like external sales as a result of their respective transfer pricing policy.

33. The two largest cost components within variable costs are the costs for aggregates and cement. Given the relative significance of the costs of purchasing aggregates, we considered that where differences arise between external and internal prices on like-for-like aggregates sales, these could, depending on their materiality, have a significant impact on the underlying margins of both the Aggregates and RMX Divisions concerned.

34. Given that we had found that internal transfer prices were indeed generally higher than external prices for aggregates,[6] we estimated the incremental financial value of this by calculating the difference between the average external and internal prices for each of the seven product categories of primary aggregates for each Major, and multiplying each difference by its corresponding internal sales volumes.

35. Based on this analysis, we estimated that the incremental financial impact of [✂] and [✂] transfer pricing policy was around £[✂] million and £[✂] million respectively. In order to calculate meaningful margins for the Aggregates and RMX Divisions, we needed to consider how these sums arising from differential average prices for internal aggregates sales should be allocated between their Aggregates and RMX Divisions. If no allocation were made, the Aggregates Divisions might have higher apparent margins (and the RMX Divisions lower apparent margins) than would be appropriate.

[6] This could be for a number of reasons, including: *(a)* a conscious policy by a Major to set internal transfer prices at a higher level than external prices or *(b)* the RMX Division purchasing higher specification (and hence more expensive) aggregates on average than those sold externally. Other factors relevant to pricing decisions may also explain some of these price differences.

36. If internal prices were set at market prices, then this incremental value should remain within the Aggregates Division, ie no further adjustments would be required, as both the Aggregates and RMX Divisions' actual margins would reflect its underlying margins—this would also mean that the apparently higher internal prices for aggregates were in fact because the RMX Division was purchasing higher specification (and hence more expensive) aggregates on average than were being sold externally. However, if internal prices were different from external prices (on like-for-like sales) as a result of its transfer pricing policy, then this incremental value should be re-allocated from the Aggregates Division to the RMX Division, ie the Aggregates Division's internal revenues and the RMX Division's costs would both fall by the value of this incremental financial impact. This would be to reflect the fact that the RMX Division was paying more for its aggregates than might otherwise be the case as a result of the Major's internal transfer pricing policy. We acknowledge that this might not entirely be a binary allocation decision and that a combination of the two might apply to different extents for each Major.

RMX Divisional margins and the impact of aggregates internal pricing on margins

37. The Majors' RMX sales volumes broadly moved in line with the market, and despite the full-year impact of the market downturn in FY09, average prices remained relatively stable. However, unit variable costs also increased at a greater pace over the Relevant Period, resulting in an erosion of the Majors' margins.

38. Based on our assumption that all average internal prices were higher than average external prices as a result of pricing policies adopted by the firms concerned,[7] we allocated a proportion of the sum arising to each Major's RMX Division to assess its impact on margins. This allocation was based on the Majors' estimates of the proportion of internal sales volumes of aggregates accounted for by their RMX Divisions.

[7] Note, however, that [✂] of the Majors stated that they had such a policy.

We found that the allocation of these sums had the most significant impact on the EBITDA margins of [✂] and [✂] RMX Divisions.

Impact of aggregates internal pricing on the Majors' financial reporting

39. We examined the Majors' legal entities which were responsible for the Relevant GB Operations and found that for all of the Majors, their Aggregates and RMX Divisions formed part of one legal reporting entity, whilst the Cement Division formed part of a separate entity, with the exception of Tarmac, where all of its Divisions formed part of the same legal reporting entity.

40. Since there was no net effect on combined profits arising from higher internal transfer prices for aggregates and higher internal costs for the RMX Division, we examined the reasons why such a policy might be adopted:

- [✂] told us that it put a higher price on internal sales of aggregates to prevent excessive discounting by its RMX sales force, which was very margin-aware.
- [✂] told us that its policy was to set an internal transfer price for aggregates that would recover inflation in [✂] cost base. According to [✂], if external prices then fell, this could result in the internal price being higher than the external price. [✂] further pointed out that its internal transfer pricing policy for aggregates did not affect competition in the RMX market, as RMX pricing was market based, not cost-plus. However, [✂] noted that its internal pricing policy for aggregates did adversely affect the profitability of its RMX business.
- [✂], [✂] and [✂] told us that they tried to set their internal transfer price for aggregates to be as close as possible to the market price.

41. We considered that if competition were otherwise effective in the supply of RMX, we did not think that the transfer pricing policy adopted by vertically integrated firms that

resulted in internal prices of aggregates being sometimes higher than external prices were likely, on their own, to have a material effect on competition in RMX.

Detailed assessment

42. The remainder of this paper sets out the full details of our assessment of the Majors' cost structures and margins.

43. For reference, the P&L data we used for our assessment for each Major's Cement, Aggregates and RMX Divisions are set out in Appendices A, B and C respectively.

Consolidated margins for the Majors' combined Relevant GB Operations

Outline of methodology

44. As outlined in our methodology paper (see Part I), we calculated the consolidated margin for the Majors' combined Relevant GB Operations by summing up each Division's total profits on its external and internal sales to arrive at a consolidated profit figure, and then dividing this figure by consolidated revenues, the sum of each division's: *(a)* external net revenues; and *(b)* internal net revenues on aggregates and cement sales to its downstream businesses other than the RMX Division. As set out in our methodology paper, we assumed that all RMX sales were generated externally.

Consolidated variable profit margins

45. Figure 1 below sets out the Majors' consolidated variable profit margins over the Relevant Period.

FIGURE 1

The Majors' consolidated variable profit margins, FY07–FY11

[✂]

Source: CC analysis of Majors' P&L data.
Notes:
1. [✂]
2. [✂]

46. Based on Figure 1 above, we found that consolidated variable profit margins for [✂] exhibited resilient and stable margins during a period in which all of the reference markets experienced a significant downturn in volumes. Over the Relevant Period, the consolidated variable profit margins for [✂], namely [✂], [✂] and [✂], moved within a relatively tight range: from [✂] to [✂] per cent for [✂] ([✂]); [✂] to [✂] per cent for [✂]; and [✂] to [✂] per cent for [✂]. [✂] was able to improve its consolidated variable profit margin significantly in [✂], in a year when the full-year effects of the market downturn would have been felt. Between FY09 and FY11, [✂] was able to maintain a relatively constant consolidated variable profit margin.

47. [✂], its consolidated variable profit margin [✂] over the Relevant Period, experiencing [✂], since when its margin [✂] by FY11.

48. Based on our analysis, we found that the market downturn in FY09[8] did not have a negative impact on the consolidated variable profit margins of the four cement producing Majors, with FY09 margins increasing on prior year levels for: [✂] (from [✂] to [✂] per cent), [✂] (from [✂] to [✂] per cent) and [✂] (from [✂] to [✂] per cent). Only [✂] margin declined slightly in FY09 from [✂] to [✂] per cent, but we noted that during the Relevant Period, [✂] had in place a hedging arrangement in relation to its power costs, absent which, its consolidated variable profit margin would

[8] Whilst the market downturn began during FY08, we examined the impact of the downturn from FY09 onwards, when the full 12 months' impact of the downturn would have been felt.

have[✂] per cent in FY08 to [✂] per cent in FY09.[9] Figure 2 below shows [✂] consolidated variable profit margins, both with and without its power hedging arrangement over the Relevant Period.

FIGURE 2

The impact of hedging on [✂] consolidated variable profit margins, FY08–FY11

[✂]

Source: CC analysis of [✂] P&L data.
Note: Over the Relevant Period, [✂] hedged power, compared with power purchased on the open market, represented [✂].

49. Based on Figure 2 above, absent its hedging arrangement, after increasing from [✂] per cent in FY08 to [✂] per cent in FY09, [✂] underlying consolidated variable profit margin [✂] year-on-year to [✂] per cent by FY11.

Consolidated EBITDA margins

50. Figure 3 below sets out the Majors' consolidated EBITDA margins over the Relevant Period. [✂]

FIGURE 3

The Majors' consolidated EBITDA margins, FY07–FY11

[✂]

Source: CC analysis of Majors' P&L data.
Notes:
1. [✂]
2. [✂]

51. Based on Figure 3 above, in contrast to the Majors' consolidated variable profit margin performance, consolidated EBITDA margins declined in FY09 for: [✂] (from [✂] to [✂] per cent), [✂] (from [✂] to [✂] per cent), [✂] (from [✂] to [✂] per cent)

[9] Whilst [✂] and [✂] also had hedging arrangements in place in relation to their power costs, the impact of [✂] hedging arrangement on consolidated margin was negligible, and [✂] was unable to estimate the profit impact of its hedging arrangement during the Relevant Period.

and [✂] (from [✂] to [✂] per cent).[10] Only [✂] saw its consolidated EBITDA margin improve from [✂] per cent in FY08 to [✂] per cent in FY09. Our analysis suggests that the erosion in the Majors' consolidated EBITDA margins in FY09 was largely driven by adverse fixed costs, which, by their very nature, would not have been immediately responsive to the sharp downturn in demand seen in the reference markets.

52. Over the Relevant Period, we found that [✂] consistently generated the highest consolidated EBITDA margin, ranging from [✂] to [✂] per cent, whilst [✂] consistently generated the lowest, ranging from [✂] to [✂] per cent ([✂]). Since FY09, however, consolidated EBITDA margins remained relatively stable for [✂] (ranging from [✂] to [✂] per cent), [✂] (from [✂] to [✂] per cent), [✂] ([✂] to [✂] per cent) and [✂] ([✂] to [✂] per cent). [✂] consolidated EBITDA margin, however, increased from [✂] per cent in FY09 to [✂] per cent in FY11.

Breakdown of divisional contribution to consolidated figures

53. In order to understand which division was the key driver for the Majors' consolidated profits, we compared each division's relative contributions to FY11 consolidated variable profit and consolidated EBITDA. This is shown in Figure 4 below. [✂]

FIGURE 4

Breakdown of divisional contribution to FY11 consolidated figures

Divisional contribution to FY11 consolidated variable profit

[✂]

Divisional contribution to FY11 consolidated EBITDA

[✂]

Source: CC analysis of Majors' P&L data.
Note: [✂]

[10] [✂]

54. Based on Figure 4 above, the Aggregates Division made the largest contribution to FY11 consolidated variable profit for [✂] ([✂] per cent), [✂] ([✂] per cent), [✂] ([✂] per cent) and [✂] ([✂] per cent). For [✂], however, its Cement Division made the largest contribution to consolidated variable profit at [✂] per cent. For the other cement-producing Majors, their Cement Divisions' contribution to consolidated variable profit was: [✂] per cent for [✂], [✂] per cent for [✂] and [✂] per cent for [✂].

55. At a consolidated EBITDA level, the divisional contributions of the Majors' Aggregates and Cement Divisions (as applicable) shown in Figure 4 above are distorted by [✂] made by their RMX Divisions.[11] For [✂], [✂] and [✂], these [✂] were relatively significant at [✂], [✂] and [✂] per cent respectively, but less so for [✂], whose RMX Division made a [✂], and for [✂], whose RMX Division made [✂] of [✂] per cent.

56. In order to make a more meaningful comparison between the relative contributions of each division, we combined the contributions of each Major's Aggregates and RMX Divisions on the basis that: *(a)* these divisions form part of the same legal entity (see also Table 8) for all of the Majors, and are separate from the legal entity housing their Cement Divisions (with the exception of [✂]); and *(b)* as a result of the Aggregates and RMX Divisions being part of the same legal entity, some main parties argued that UK transfer pricing rules did not apply such that prices on internal aggregates sales may be different from those on like-for-like external aggregates sales, whether this was intended or not. As we set out later in this paper, [✂] and [✂] told us that their internal aggregates sales were priced higher than like-for-like external aggregates sales, [✂] told us that they set their internal prices as close as possible to open market prices.

[11] Based on our methodology of calculating each division's contribution, [✂].

57. Figure 5 below shows the relative contributions to consolidated EBITDA of the combined Aggregates and RMX Divisions, and the Cement Division (as applicable).

FIGURE 5

Combined Aggregates and RMX Divisional vs Cement Divisional contribution to FY11 consolidated EBITDA

[✂]

Source: CC analysis of Majors' P&L data.
Note: [✂]

58. Figure 5 above shows that the Cement Division makes a significant contribution to the consolidated EBITDA of Cemex (at [✂] per cent), Hanson (at [✂] per cent) and Lafarge (at [✂] per cent). However, Tarmac's Cement Division accounted for just [✂] per cent of its consolidated EBITDA, with its combined Aggregates and RMX Division contributing [✂] per cent.

59. Based on our analysis, we found that the Cement Division was the key driver of consolidated EBITDA for Cemex, Hanson and Lafarge, whilst the combined Aggregates and RMX Division was the key driver of Tarmac's consolidated EBITDA. Our analysis suggests that in this respect, there is a degree of alignment in the business incentives of Cemex, Hanson and Lafarge, whilst Tarmac's incentives may be different from those of the other cement-producing Majors.

Cost structure assessment of the Majors' Cement Divisions

Comparison of cost structures of the Majors' Cement Divisions

60. We next examined the cost structure of each Major's Cement Division and found that over the Relevant Period, the cost structure had remained relatively stable. Figure 6 below sets out the cost structures of the Majors' Cement Divisions in FY11 based on the cost per unit sold and percentage of total costs approaches.

FIGURE 6

Cost structures of the Majors' Cement Divisions, FY11

Cost per unit sold (£/t)

[✂]

% of total costs

[✂]

Source: CC analysis of Majors' P&L data.
Note: 'Other fixed costs' include both divisional fixed costs and central costs.

Analysis of symmetry in variable costs

61. Based on Figure 6 above, a comparison between the Majors showed that their Cement Divisions exhibited a large degree of symmetry in their unit variable costs (or variable cost per tonne sold), which ranged from £[✂] ([✂]) to £[✂] ([✂]) per tonne, or between [✂] ([✂]) and [✂] ([✂]) per cent of total costs. Among the cement producers, [✂] benefited from the lowest unit variable cost at £[✂]. Excluding [✂], the range for the unit variable cost of the remaining three cement producers considerably tightens, ie from £[✂] ([✂]) to £[✂] ([✂]).

62. We noted that [✂], [✂] and [✂] told us that they were able to estimate, to varying degrees of accuracy, their competitors' variable costs. [✂], however, told us that it did not consider an awareness of its competitors' cost structures as commercially relevant:

(a) [✂] told us that the costs for the main inputs into cement on the 'variable cost side' would be 'very similar', for example coal or coal substitutes were internationally traded; the unit price of power in the UK was known with the 'only variable' being whether a company hedged or bought on the spot market; and labour costs would be broadly similar. It told us that whilst its 'average variable cost' was £[✂] per tonne, it would not expect this figure for [✂] to be 'significantly different', [✂]. It added that in relation to 'efficiency', 'cement manufactur-

ing technology' had 'not evolved in the last 40 years', and therefore, it would expect the 'same level of process efficiencies or inefficiencies'. It told us that whilst it would not know the details of the relative efficiency of its competitors' cement works, it could postulate their fuel and power efficiencies based on the type of kiln used, and on publicly available information on each cement works' annual verified carbon emissions under the ETS. It added that whilst these were broad approximations, it could use technical key performance indicator data for [✂], such that it could 'reasonably accurately estimate' the key performance indicators for similar kilns operated by its competitors.

(b) [✂] told us that it estimated its competitors' costs based on the cement manufacturing technology employed, but that it could not verify how accurate its estimates were. It added that it would not be able to estimate its competitors' 'overhead, corporate costs and capital costs', suggesting that its estimate focused on variable costs, or a similar cost measure.

(c) [✂] told us that it tried to estimate its competitors' cost structures based on its own plant and equipment, as it was in its interest to understand its competitors' strengths and weaknesses, but added that any estimate would need to be based on a wide range of assumptions, which would result in 'extremely rough estimates'. It considered that clinker production costs were not transparent since it did not know the efficiency of another cement works, or its 'material and energy costs, all of which were required to calculate the cost of producing clinker'.

(d) In contrast to the other cement-producing Majors, [✂] told us that it did not consider a 'recognition or awareness' of its competitors' cost structures as particularly relevant for its commercial decisions since it tended to [✂].

63. Based on our analysis and the comments from the cement-producing Majors above, we considered that the costs of producing clinker, as measured by unit variable cost, would not only be similar for each of the cement-producing Majors, but would also be

relatively transparent, or at least, could be estimated to a reasonable degree of accuracy from readily available public data, including information on each cement works' kiln type, manufacturing technology and plant capacity.

Analysis of symmetry in fixed costs

64. As mentioned in our methodology paper (see Part I), we would approach any comparison of fixed cost structures with some caution on the basis that these may be influenced by differences in each company's management, organizational and operational structure, which are likely to change over time as a result of any internal reorganization and restructuring activities. Differences in depreciation and amortization may also be a reflection of the depreciation policy adopted.

65. Furthermore, differences in unit fixed costs or fixed costs as a percentage of total costs may simply reflect differences in production capacity utilization, in particular for capital-intensive industries where fixed costs account for a relatively significant proportion of total costs, and where, all things being equal, greater capacity utilization would result: *(a)* in lower unit fixed costs; and *(b)* a higher proportion of total costs being accounted for by variable costs.

66. However, notwithstanding these possible issues, Figure 6 above shows that unit fixed cost (excluding depreciation and amortization) was £[✂] per tonne for [✂] and £[✂] per for [✂] and [✂]. For [✂], this ratio was lower at £[✂] per tonne. When we included depreciation and amortization, unit fixed cost was £[✂] per tonne for [✂], £[✂] for [✂], £[✂] for [✂] and £[✂] for [✂].

67. Based on our analysis, whilst we found that unit fixed costs were similar for three of the cement-producing Majors, we considered that differences in each company's management, organizational and operational structure would reduce symmetry and

transparency in their fixed cost structures to some extent. However, we also considered that there were certain elements within fixed costs which would lend themselves to improving cost structure transparency, such as those costs related to the production process or to the plant itself, for example the costs of production staff and repairs and maintenance at the plant, such that these costs could be reasonably estimated by outside competitors.

Analysis of variable cost symmetry based on electric power costs

68. In FY11, the cost of electric power accounted for between [✂] ([✂]) and [✂] ([✂]) per cent of a Cement Division's variable costs, and between [✂] ([✂]) and [✂] ([✂]) per cent of its total costs. Table 1 below sets out the proportion of variable and total costs accounted for by electric power for each of the Majors' Cement Divisions.

TABLE 1 **Electric power costs* as a % of variable costs and total costs for the Majors' Cement Divisions**

% of variable costs

	2007	*2008*	*2009*	*2010*	*2011*
Cemex	[✂]	[✂]	[✂]	[✂]	[✂]
Hanson	[✂]	[✂]	[✂]	[✂]	[✂]
Lafarge	[✂]	[✂]	[✂]	[✂]	[✂]
Tarmac	[✂]	[✂]	[✂]	[✂]	[✂]

% of total costs

	2007	*2008*	*2009*	*2010*	*2011*
Cemex	[✂]	[✂]	[✂]	[✂]	[✂]
Hanson	[✂]	[✂]	[✂]	[✂]	[✂]
Lafarge	[✂]	[✂]	[✂]	[✂]	[✂]
Tarmac	[✂]	[✂]	[✂]	[✂]	[✂]

Source: CC analysis of Majors' P&L data.

*Electric power costs as presented in the Majors' P&L data.

69. Given that electric power costs account for a significant proportion of variable costs, as part of our assessment to determine cost structure symmetry, we examined whether there were any similarities in the Majors' electric power costs and their trends over the Relevant Period. Figure 7 below shows the electric power cost per tonne of cement produced for each of the Majors' Cement Divisions.

FIGURE 7

Cement Division: electric power cost per tonne of cement produced (£/t)

[✂]

Source: CC analysis of Majors' P&L data.
Note: Each Major's electric power cost per tonne was based on production volumes rather than sales volumes.

70. Figure 7 above shows that in FY07, the electric power cost per tonne produced was around £[✂] for [✂] and [✂], £[✂] for [✂] and £[✂] for [✂]. In FY08, this ratio converged to around £[✂] per tonne for [✂], [✂] and [✂], whilst it increased to £[✂] per tonne for [✂]. Since FY09, [✂] ratio has remained [✂] at around £[✂] per tonne, whilst the ratios of the other Majors converged to around £[✂]. One possible explanation for these variations is the impact of hedging arrangements on the Majors' electric power costs.[12] In relation to their electric power costs, [✂] cement-producing Majors, [✂],[13] had hedging arrangements in place during the Relevant Period. For example, [✂] told us that as a result of its electric power hedging arrangements, its electric power costs were £[✂] and £[✂] than purchasing at open market rates [✂].

71. Taking FY07 as the base year, Figure 8 below compares the trends over the Relevant Period in the Majors' electric power cost per tonne produced and the UK day-ahead price of electricity, which we used as a proxy for the open market price of electricity. All figures were rebased to 100.

FIGURE 8

Cement Division: electric power cost per tonne produced vs open market prices (rebased to 100)

[✂]

Source: CC analysis of Majors' P&L data. Annual UK day-ahead prices are based on averaging monthly prices from Bloomberg. Electricity day-ahead prices on Bloomberg are only available from September 2007.
Note: Each Major's electric power cost per tonne was based on production volumes rather than sales volumes.

[12] [✂] told us that its electric power costs were 'delivered costs', ie they included both the commodity element (which can be subject to a hedging arrangement), and the non-commodity element (eg transmission, distribution taxation and other supply-related charges).
[13] [✂]

72. Figure 8 above shows that, with the exception of [✂], changes in the Majors' electric power cost per tonne produced did not correlate with the year-on-year changes in UK day-ahead prices, with their ratios often moving in opposite directions.

73. We requested [✂], [✂] and [✂] to provide us with its estimate of the cost and profit impact of its hedging arrangement. Only [✂] and [✂] were able to provide us with the required data. Adjusting for these hedging arrangements for [✂] and [✂], the electric power cost per tonne produced for [✂], [✂] and [✂] shared similar trends over the Relevant Period, converging to around £[✂] per tonne in FY11. This is shown in Figure 9 below. Whilst [✂] was unable to provide us with an estimate of the cost and profit impact of its hedging arrangement over the Relevant Period, we would expect that absent its hedging arrangement, [✂] ratio would also follow a similar trend as the other Majors.

FIGURE 9

Cement Division: unhedged electric power cost (£/t)

[✂]

Source: CC analysis of Majors' P&L data.
Note: Each Major's electric power cost per tonne was based on production volumes rather than sales volumes. The unhedged electric power cost was based on estimates from [✂] and [✂], which are set out in Table 3 below. [✂] was unable to provide us with an estimate of the cost and profit impact of its hedging arrangement.

74. Figure 10 below rebases the figures shown in Figure 9 above to 100, using FY07 as the base year, and compares the trends in electric power costs for [✂], [✂] and [✂], against UK day-ahead prices.

FIGURE 10

Cement Division: unhedged electric power cost per tonne produced vs UK day-ahead prices (rebased to 100)

[✂]

Source: CC analysis of Majors' P&L data. Annual UK day-ahead prices are based on averaging monthly prices from Bloomberg. Electricity day-ahead prices on Bloomberg are only available from September 2007.
Note: Each Major's electric power cost per tonne was based on production volumes rather than sales volumes. The unhedged electric power cost was based on estimates from [✂] and [✂], which are set out in Table 3 below. [✂] was unable to provide us with an estimate of the cost and profit impact of its hedging arrangement.

75. As Figure 10 shows, absent their hedging arrangements, the directional trends for the electric power costs of [✂], [✂] and [✂] are broadly in line with UK day-ahead prices, save for the magnitude of these changes.

76. Based on our analysis, we found that hedging arrangements were likely to reduce an element of symmetry and transparency in relation to each Cement Division's actual variable costs.[14] Given the relative significance of electric power costs in a Cement Division's overall cost structure, variations in the actual electric power cost per tonne produced largely explain the slight variation we saw in the Majors' unit variable costs, which for FY11 ranged from £[✂] ([✂]) to £[✂] ([✂]).

Cost transparency arising from ETS verified emissions data

77. As part of our analysis of variable cost symmetry between the Majors' Cement Divisions, we considered whether there were any other means by which cost transparency might increase. We examined whether the Majors might be able to estimate total variable costs (in absolute terms) for each of their competitors. In order to do this, the Majors must firstly be able to estimate their competitors' production volumes.

78. We found that based on the annual verified carbon emissions data for each ETS installation (including each cement works in GB) published by the European Commission on its website in April each year, clinker production volumes could be estimated for each cement works, for example based on an estimation of the ratio of clinker tonnes produced per tonne of carbon emissions. [✂] confirmed to us that it could infer each cement works' actual production volumes from the verified carbon emissions data, and added that 'cement production' was 'usually a proxy' for sales volumes. We considered that this would enable each cement-producing Major to

[14] [✂]

estimate each of its competitors' shares of clinker production volumes. Based on a reasonable estimate of both unit variable cost and total clinker production volumes, we considered that a Cement Division's total variable costs could be estimated by its competitors to a reasonable degree of accuracy.

Analysis of distribution costs

79. We would necessarily expect unit distribution cost to vary between the Majors primarily given the differences in average distances travelled to each customer's jobsite by each of the Majors, as well as the differences in the relative proportions of collected and delivered sales.

80. Based on the Majors' external cement sales over the Relevant Period, Figure 11 below shows that average distances varied considerably between the Majors, and for each Major, also over time. Whilst we considered that a comparison of distribution cost per mile would be a better approach, given the limitations of average distance measures in the Majors' transactions data, for example some Majors measured road distances whilst another, radial distances, we did not pursue this analysis further.

FIGURE 11

Cement Divisions: weighted average delivery distances (miles) for bulk cement

[✂]

Source: Majors' transactions data.
Note: We understand average delivery distances to be road distances for [✂], [✂] and [✂]. [✂] average delivery distances are radial distances. All average distances are in miles.

Cement Division: site-level cost structure assessment

81. We also attempted to examine cost structures at an individual cement works level. However, a more granular comparison of cost structures proved less feasible given the inclusion by certain Majors of non-clinker production sites within their site P&L data, for example depots, cement import terminals and blending stations. Based on the P&L data we received, a site could be one, or a combination, of the following: *(a)*

a cement works; *(b)* a sale or distribution facility, eg a depot or cement import terminal; or *(c)* a cost centre, eg central offices.

82. Table 2 below shows the total number of sites contained within each Major's Cement Division, and the proportion of those sites which were treated as a production centre (ie where production volumes were greater than nil). In relation to Table 2 below, the smaller the number of production sites compared with the number of total sites, the greater the disaggregation of the site level P&L data, for example a greater separation of the P&L data for a cement works from the other non-production sites.

TABLE 2 **Cement Division: number of production and non-production sites (by Major)**

	Cemex	*Hanson*	*Lafarge*	*Tarmac*
2011 production sites	3	3	5	1
2011 total sites	4	3	7	1
2010 production sites	3	3	6	1
2010 total sites	4	3	7	1
2009 production sites	4	3	6	1
2009 total sites	5	3	7	1
2008 production sites	6	3	7	1
2008 total sites	9	3	7	1
2007 production sites	4	3	7	1
2007 total sites	11	3	7	1

Source: CC analysis of Majors' P&L data.

*Production site: defined as where a site's annual production volumes were greater than zero. Sites with zero production but positive sales volumes were not counted as a production site.
Note: Consolidation and other adjustment columns were not counted as a site.

83. Based on Table 2 above, Tarmac's Cement Division's P&L data comprised of a single site, whose P&L data included not only its cement works, but also a cluster of its associated non-production facilities, eg depots and railheads. Hanson's Cement Division's P&L data comprised of three sites, where each site's P&L data included a cement works, but also a cluster of its associated non-production facilities. [✂]

84. Notwithstanding the issues set out above which reduced our ability to assess cost structures at a stand-alone cement works level, Figure 12 below sets out the cost

structure of each Major's main production sites (not individual cement works) based on FY11 figures.

FIGURE 12

Cost structure assessment of the Majors' cement sites* (£/t)

[✂]

Source: Majors' P&L data.
*Given the inclusion of non-production sites within each site, the sites shown in this figure do not represent a stand-alone cement works.
Note: Based on Table 2 above, [✂] and [✂] provided their site P&L data based on combining each production site (ie cement works) with various non-production sites, whilst [✂] and [✂] appeared to provide a more granular breakdown of their site P&L data, albeit to a limited extent.

85. Bearing in mind the caveats surrounding Figure 12 above, FY11 unit variable cost ranged from £[✂] to £[✂] (both accounted for by [✂] cement works and their associated non-production sites, ie [✂]). Whilst [✂] and [✂] had the highest unit variable cost in FY11 at £[✂] and £[✂] respectively, [✂] had the lowest at £[✂]. With the exception of these three sites, the unit variable cost for the other sites were closer to the average unit variable cost figure of around £[✂] per tonne.

Cement Division: analysis of margin performance and trends

86. We now turn to examine the margin performance and trends of the Majors' Cement Divisions.

Cement Division: Majors' sales volume performance vs the market

87. Figure 13 below sets out the performance of the Majors' total cement sales volumes relative to the market over the Relevant Period rebased to 100, using FY07 as the base year.

FIGURE 13

Majors' cement sales volumes* vs market (rebased to 100)

[✂]

Source: Majors' P&L data, and Mineral Products Association for market volumes.
*Sales volumes based on total sales, including both external and internal sales.
Note: Market performance based on sales of cement produced in GB.

88. Based on Figure 13 above, unlike the other cement producers, [✂] consistently outperformed the market, with sales volumes increasing year-on-year since the end of FY08. Whilst [✂] sales volumes performed in line with the market, [✂] and [✂] saw steeper falls in their sales volumes on FY07 levels.

Cement Division: Majors' average prices and unit variable costs vs market

89. We then examined the trends in each Cement Division's average prices and unit variable costs over the Relevant Period and compared these against market volumes. Figure 14 below shows each Major's unit net revenues (as a proxy for the average price), unit variable cost, and market volumes rebased to 100, using FY07 as the base year [✂].

FIGURE 14

Cement Division: average price* (external sales) vs variable costs vs market (rebased to 100)

[✂]

Source: Majors' P&L data, and Mineral Products Association for market volumes.
*We adopted net revenue per tonne sold as a proxy for the average price.
Note: Market performance based on sales of cement produced in GB.

90. Figure 14 above shows that average prices have generally kept pace with, or increased at a faster pace than unit variable costs, resulting in variable profit margins being successfully maintained over the Relevant Period against a backdrop of declining market volumes and increasing costs. In relation to its own performance, [✂] told us that its cement sales were [✂].

91. As we set out later in this paper, we note that the performance of the Majors' Cement Divisions contrasted sharply with the performance of their respective Aggregates and RMX Divisions, where changes in average prices were generally outpaced by changes in unit variable costs, resulting in an erosion of their margins over the Relevant Period.

Cement Division: external and internal price trends

92. As outlined in our methodology paper (see Part I), we calculated variable profit and EBITDA margins on the Majors' external and internal sales of cement separately. Figure 15 below shows how average external and internal prices for each of the Majors have moved over the Relevant Period.

FIGURE 15

Cement Division: average price* trends on external, internal and total sales

[✂]

Source: Majors' P&L data.
*We adopted net revenue per tonne sold as a proxy for the average price.

93. Based on Figure 15 above, we found that for [✂] and [✂], their average external prices were broadly in line with their average internal prices. However, over the Relevant Period, average external prices exceeded average internal prices for [✂], and to a lesser extent, for [✂]:

(a) [✂] average external prices were consistently higher than average internal prices over the Relevant Period by an average of £[✂] per tonne over the Relevant Period, and by up to £[✂] per tonne (in FY10). [✂] told us that given that it had '[✂] packed sales (which have additional costs and a higher selling price)', almost all of which was sold externally during the Relevant Period, its average external price would be 'skewed upwards' due to the higher external selling price for bagged cement compared with bulk cement. Whilst we did not have a sufficiently detailed cost breakdown to calculate margins separately on its bulk and bagged cement sales, we found that based on [✂] FY11 external cement sales, bagged cement sales accounted for [✂] proportion of its external cement sales volumes at [✂] per cent, and its average external delivered price on bagged cement was higher than on bulk cement at £[✂] per tonne compared with £[✂] per tonne for bulk cement.

(b) [✂] average price was similar for its external and internal sales in FY07 and from FY10 onwards, but diverged during the two intervening years in FY08 and FY09, when average external prices exceeded average internal prices. In relation to [✂] higher average external prices, we note that this appears consistent with [✂].

Cement Division: external and internal margins

94. Figure 16 below sets out the variable profit margin on a return on sales basis for each of the Majors' Cement Divisions, showing margins separately on each of their external, internal and combined total cement sales.

FIGURE 16

Cement Division: variable profit margins (% of net revenues)

[✂]

Source: Majors' P&L data.
*[✂]

95. Figure 17 below sets out the Majors' Cement Divisions' EBITDA margins on a return on sales basis over the Relevant Period, showing margins separately on their external, internal and combined total cement sales.

FIGURE 17

Cement Division: EBITDA margins (% of net revenues)

[✂]

Source: Majors' P&L data.
*[✂]

96. Based on Figures 16 and 17 above, we found that the trends in the Majors' margins on their external and internal sales were consistent with the trends in their average external and internal prices, where over the Relevant Period, [✂] and [✂] showed similar margins on their external and internal sales, whilst [✂] and [✂] (only for FY08 and FY09) showed higher margins on their external sales than on their internal sales. [✂] external and internal margins converged in FY07, FY10 and FY11.

97. As noted in our methodology paper (see Part I), [✂] told us that our methodology for apportioning costs between external and internal sales based on external and internal sales volumes did not take into account product mix which could have an impact on costs between external and internal cement sales, [✂].

98. Using the data contained within Figure 16 above, Figure 18 below focuses on the Cement Divisions' variable profit margins over the Relevant Period on external sales only.

FIGURE 18

Cement Division: variable profit margin (% of net revenues) on external sales

[✂]

Source: Majors' P&L data.
Note: [✂].

99. Based on Figure 18 above, FY08 variable profit margins remained broadly in line with prior year levels for [✂], [✂] and [✂]. [✂] In FY09, margins increased for all of the Majors except [✂], whose margin declined by [✂] percentage point to [✂] per cent. For the three other Majors whose margins increased in FY09:

(a) [✂] saw [✂] percentage point increase to [✂] per cent;

(b) [✂] margin increased by [✂] percentage points to [✂] per cent;[15] and

(c) [✂] margin increased by [✂] percentage points to [✂] per cent.

100. It is worth noting here that our sensitivity analysis on the Cement Divisions' margins (which is set out later in this paper) examined the impact of [✂] hedging arrangement on its margins. Based on this analysis, whilst [✂] actual margin declined by [✂] percentage point [✂], absent its hedging arrangement, [✂] underlying margin

[15] Whilst [✂] variable profit margin increases from [✂] per cent in FY08 to [✂] per cent in FY09, the difference is actually [✂] percentage points due to rounding effects.

trends are similar to those of the other cement producing Majors, increasing from [✂] per cent in FY08 to [✂] per cent in FY09.

101. In FY10, the average external price of cement declined for all of the Majors, with unit net revenues falling by [✂], [✂], [✂] and[✂]. The net effect of these price falls resulted in FY10 margins [declining for three out of the four GB producers]. However, we noted that [✂]. By the end of FY10, the variable profit margin was [✂] per cent for Cemex, [✂] per cent for Hanson, [✂] per cent for Lafarge, and [✂] per cent for Tarmac, with [✂] having the highest variable profit margin, as well as the lowest unit variable costs relative to the other cement-producing Majors.

102. The average external price increased for all of the Majors in FY11, by £[✂], £[✂], £[✂] and £[✂], and FY11 margins increased by [✂] percentage points for [✂], [✂] and [✂], but declined by [✂] percentage points for [✂]. However, absent [✂]. In relation to [✂] margin decline, Figure 14 above showed that the rate of increase in its average price was offset by the rate of increase in its variable costs.[16]

103. Based on the above analysis, we found that the impact of the sharp downturn in market demand in FY09[17] did not have a negative impact on the cement-producing Majors' variable profit margins (on external sales only), with [✂], [✂] and [✂] all experiencing increases in margins whilst [✂] margin remained broadly flat on prior year levels. Throughout this period, margins have remained relatively stable and resilient for each of the Majors with margins moving within a relatively tight range. The only two anomalies in relation to this margin stability relate to the margin increases from [✂] to [✂] per cent for [✂] and from [✂] to [✂] per cent for [✂], both of which took place in FY09 when the market downturn would have had its first

[16] [✂]
[17] Whilst the market downturn began towards the end of FY08, we have examined the impact of the downturn from FY09 onwards, when the full impact of the downturn would have been felt.

full-year impact on their Cement Divisions. Over the Relevant Period, for [✂], excluding its [✂] per cent margin in FY08, its margins ranged from [✂] to [✂] per cent, and for [✂], excluding its [✂] per cent margin in FY09, its margin ranged from [✂] to [✂] per cent. For the other two cement producing Majors, margins ranged from [✂] to [✂] per cent for [✂] and from [✂] to [✂] per cent for [✂].

104. A similar result can also be seen in relation to the Majors' variable profit and EBITDA margins based on the per unit sold approach. As such, we have not repeated the analysis here and the results can be found in Appendix D instead.

Cement Division: margin sensitivity analysis

105. We conducted two sensitivity analyses on the margins of the Majors' Cement Divisions: *(a)* based on no hedging arrangements on their power costs; and *(b)* based on including the proceeds of selling surplus ETS carbon allowances in our calculation of profit.

Sensitivity analysis—power hedging arrangements

106. Table 3 below sets out our first sensitivity analysis based on a scenario of eliminating all hedging arrangements during the Relevant Period. We asked the Majors to calculate the profit impact of having to purchase their hedged inputs at open market prices. Only [✂] and [✂] were able to provide us with sufficient information to perform this analysis. [✂] told us that it was 'not abnormal to use a hedge at this point', and that many 'large energy intensive companies made similar decisions in the face of unprecedented cost increases and uncertainty'. [✂] told us that it did not have any hedging arrangements as [✂]. Table 3 below sets out the profit impact absent any hedging arrangements for [✂] and [✂].

TABLE 3 **Profit impact absent any power hedging arrangements ([✂] and [✂] only)**

	Profit impact absent hedge, £m			
	FYE 31 December			
	2008	*2009*	*2010*	*2011*
[✂]*	[✂]	[✂]	[✂]	[✂]
[✂]†	[✂]	[✂]	[✂]	[✂]

Source: [✂] and [✂],.

*[✂]
†[✂]

107. Figure 19 below shows the profit impact on [✂] and [✂]variable profit margins (based on the return on sales approach).

FIGURE 19

The impact of hedging arrangements on variable profit margins (return on sales) for [✂] and [✂], FY08–FY11

[✂]

Source: [✂] and [✂] P&L data and FQ responses.

108. Figure 19 above shows that this sensitivity analysis has very little impact on [✂] margin, but a relatively significant impact on [✂], where absent the hedge, its margin would fall by [✂] percentage points in FY08, but increase by [✂] percentage points in FY09 and by [✂] percentage points in FY10. The impact of [✂] hedging arrangement progressively fell in FY10 and FY11 as the hedged proportion of its power costs decreased from [✂] per cent in FY09 to [✂] per cent in FY10 and around [✂] per cent in FY11. When comparing [✂] and [✂] variable profit margins absent any hedging arrangements, we note the similarity in their margin trends, as well as their margin levels, eg in FY09, the actual variable profit margin for [✂] and [✂] was [✂] and [✂] per cent respectively. Absent their hedging arrangements, the variable profit changes to [✂] per cent for both [✂] and [✂]. [✂]

Sensitivity analysis—inclusion of sale proceeds of ETS carbon allowances

109. Table 4 below sets out our second sensitivity analysis based on including all of the proceeds from the sale of surplus carbon allowances, as permitted under the ETS. Table 4 shows the extent to which these proceeds have historically enhanced the margin performance (measured as a percentage of net revenues) of the Majors' Cement Divisions.

TABLE 4 **Cement Division margin sensitivity: impact on margins of including carbon allowance sale proceeds**

	FYE 31 December			
	2008	*2009*	*2010*	*2011*
	ETS sale proceeds, £m			
Cemex*	[✂]	[✂]	[✂]	[✂]
Hanson	[✂]	[✂]	[✂]	[✂]
Lafarge	[✂]	[✂]	[✂]	[✂]
Tarmac	[✂]	[✂]	[✂]	[✂]
	Margin impact, % of net revenues			
Cemex	[✂]†	[✂]	[✂]	[✂]
Hanson	[✂]	[✂]	[✂]	[✂]
Lafarge	[✂]	[✂]	[✂]	[✂]
Tarmac	[✂]	[✂]	[✂]	[✂]

Source: Majors' P&L data.

*[✂]
†[✂]

110. Based on Table 4 above, including the full amount of the carbon allowance sale proceeds each year, margins over the Relevant Period can increase by up to: [✂] percentage points for [✂] and [✂], [✂] percentage points for [✂], and [✂] percentage points for [✂].

111. For the purposes of our assessment, we did not consider it appropriate to include the sale proceeds arising from the sale of any excess carbon allowances in our calculation of profits on the basis that given their volatility, these proceeds have the potential to distort significantly any underlying margin trends. This is because these sale proceeds depend on:

(a) the number of surplus carbon allowances sold, which will not only depend on current production levels, but also on whether the producer wished to retain some of its surplus carbon allowances to offset against future production; and

(b) the market price of carbon allowances at the time of their sale, which is subject to market volatility.

Cement Division: profits from cement sales vs carbon allowance sales

112. We also examined whether the Majors' Cement Divisions faced a genuine choice between selling cement (and surrendering the required carbon allowances), and selling carbon allowances (and foregoing the profits on cement sales) by comparing the profits generated from cement production with the average price of a carbon allowance. We note that our analysis focuses only on comparing the relative financial gain of either surrendering carbon allowances and producing more cement, or selling carbon allowances on the secondary market.

113. We first estimated that each carbon allowance approximately equated to 1.4 tonnes of CEM I grey cement production, based on the product benchmark applied to EU clinker producers under ETS Phase III of 0.766 tonnes of carbon emissions per tonne of clinker, and a clinker to cement conversion ratio of 1.1 tonnes of CEM I cement per tonne of clinker (based on a broad consensus from the cement-producing Majors).

114. In relation to our above calculation, [✂] told us that based on its cement works at [✂] and [✂] (with emission factors of [✂] and [✂] tonnes of carbon emissions per tonne of clinker), this would equate to around 1.3 tonnes of cement rather than our calculated 1.4 tonnes. However, we accepted that whilst each cement works would have a different emission factor, these variations did not appear to have a material difference on our final calculations. We would also note that our reason for adopting

the ETS product benchmark of 0.766 as our emission factor was to ensure that the emission factor we used was based on publicly available information.

115. For each Cement Division, we then calculated its EBITDA (based on external sales) for every 1.4 tonnes of cement, ie the EBITDA generated from surrendering one carbon allowance. We considered that where the market price of a carbon allowance exceeded the EBITDA per carbon allowance surrendered, then at the margin, the Cement Division could maximize profits by ceasing any additional production of cement, and instead sell its unused carbon allowances. Table 5 below sets out for the cement producing Majors, their EBITDA for every 1.4 tonnes of cement produced (in sterling and euro).

TABLE 5 **Cement Division: EBITDA (on external sales) for every surrendered carbon allowance**

					£/1.4t
	2007	*2008*	*2009*	*2010*	*2011*
Cemex	[✂]	[✂]	[✂]	[✂]	[✂]
Hanson	[✂]	[✂]	[✂]	[✂]	[✂]
Lafarge	[✂]	[✂]	[✂]	[✂]	[✂]
Tarmac	[✂]	[✂]	[✂]	[✂]	[✂]
					€/1.4t
Cemex	[✂]	[✂]	[✂]	[✂]	[✂]
Hanson	[✂]	[✂]	[✂]	[✂]	[✂]
Lafarge	[✂]	[✂]	[✂]	[✂]	[✂]
Tarmac	[✂]	[✂]	[✂]	[✂]	[✂]

Source: Majors' P&L data and Bloomberg (BGN pricing source) for historic annual exchange rates.*

*Average annual euro exchange rates: 1.461 (FY07), 1.254 (FY08), 1.122 (FY09), 1.165 (FY10) and 1.152 (FY11).
Note: N/A = means not available.

116. Based on Table 5 above, if the market price of a carbon allowance was equal to €[✂] in FY11 then at the margin, it would have been equally profitable for [✂] or [✂] to either produce cement or sell carbon allowances. If the market price of a carbon allowance was greater than €[✂], then it would be more profitable at the margin for them to sell the carbon allowance at the market price rather than to surrender the carbon allowance and produce an additional 1.4 tonnes of cement. We have assumed for the purposes of this analysis that the Cement Division faces a binary choice of either producing more cement or selling carbon allowances, rather than to

reduce cement production since any significant reduction in cement production volumes may have an impact on unit fixed costs and consequently unit EBITDA.

117. Since the average price of a carbon allowance[18] was around €15 during ETS Phase I (January 2005 to December 2008), ranging from €0.03 to €28.01, and around €20 during ETS Phase II (January 2008 to December 2012), ranging from €6.78 to €30.84, we considered that when compared with the relatively higher EBITDA generated from cement sales during the Relevant Period, it would almost always have been more profitable to produce cement at the margin and surrender the required carbon allowances, than sell carbon allowances.

118. [✂] told us that there were many factors that would affect our calculation, including, among others: what product was manufactured; the production costs and carbon footprint of the plant; whether rationalization and transfer of carbon allowances were permitted; the current and future price of carbon allowances; and whether there was a free allocation of carbon allowances due to carbon leakage considerations. Whilst these may be valid considerations in relation to whether carbon allowances should be surrendered or sold, our analysis focused purely on the relative financial gain of surrendering or selling carbon allowances at the margin, and therefore other considerations were not taken into account.

119. On the basis that it would have been more profitable to surrender rather than sell carbon allowances, the significant proceeds arising from the sale of carbon allowances in Table 4 above, for example £[✂] million and £[✂] million in FY08 for [✂] and [✂] respectively, suggest that the Majors were either unable to produce or sell any more cement, and therefore the carbon allowances that were sold should have represented a genuine surplus to requirements.

[18] Carbon allowance prices sourced from Thomson Reuters Point Carbon.

Assessment for the Majors' Aggregates and RMX Divisions

120. This section sets out our assessment of both the Majors' Aggregates and RMX Divisions. Our assessment of average aggregates prices found that the Majors' average prices were generally lower on their external sales than on their internal sales, including sales made to their downstream RMX Divisions.

121. We considered that where internal aggregates prices were not set at market prices, this would have an impact on the underlying margins of both the Aggregates and RMX Divisions concerned. Where internal prices for aggregates are set higher than their market price as a result of a company's transfer pricing policy, then the Aggregates Division might have higher apparent margins (and the RMX Division lower apparent margins) than would be appropriate.

122. We therefore examined the impact of any pricing differential on the margins of the Aggregates and RMX Divisions. As such, we set out our assessment of cost structures and margins for both the Aggregates and RMX Divisions under this section, moving between the different aspects affecting both Divisions. This was less of an issue for the Majors' Cement Divisions, where we found that average external and internal prices were broadly in line.

Aggregates Division: average external and internal price trends

123. We first examined the trends in average external and internal prices for the Majors' Aggregates Divisions over the Relevant Period. Figure 20 below shows the average prices for each of the Majors' external, internal and combined total sales for aggregates over the Relevant Period.

FIGURE 20

Aggregates Division: average price* trends on external, internal and total sales

[✂]

Source: Majors' P&L data.
*We adopted net revenue per tonne sold as a proxy for the average price.
Note: [✂]

124. Figure 20 above shows that based on unit net revenues as a proxy for the average price, the average price was higher on internal sales than on external sales for all of the Majors.

125. [✂], [✂] and [✂] told us that they tried to set their internal transfer price for aggregates to be as close as possible to the market price. Therefore, the differential in external and internal prices for aggregates could be explained by product sales mix, whereby internal sales generally comprised of higher specification and therefore higher value aggregates than for external sales. In addition to product sales mix, [✂] told us that a number of other factors also influenced pricing, including geography, customer location and customer size, all of which may be relevant for explaining any difference in its external and internal prices.

126. [✂] and [✂], however, told us that their internal prices were higher than their external prices as a result of their internal transfer pricing policy. [✂] added that its internal aggregates sales took place within the same legal entity, and therefore were not 'formal sales' from a 'traditional accounting perspective', and were not subject to transfer pricing rules. [✂] added that internal selling prices had diverged from external selling prices as a result of 'disparities between the realisation of price increase requests' in relation to external and internal prices. Further details of their transfer pricing policy are set out later in this paper.

Aggregates Division: impact of sales mix on external and internal prices

127. We explored the impact of product sales mix on average external and internal aggregates prices. Figure 21 below first examines the impact on average external and internal prices of collected and delivered sales of aggregates for all of the Majors based on their FY11 Transactions Data.

FIGURE 21

Aggregates Division: external and internal prices for collected and delivered sales, FY11

[✂]

Source: Majors' transactions data.
Note: We note that this analysis does not control for a number of factors relevant in pricing, such as delivery distances for delivered sales.

128. Figure 21 above shows that:

(a) for collected aggregates sales, average FY11 prices on internal sales were consistently higher than on external sales; and

(b) for delivered aggregates sales, average prices were higher on internal sales for [✂], [✂] and [✂], whilst the reverse was the case for [✂] and [✂]. However, we note that differences in average prices on delivered sales might be due to differences in the average distances travelled to customers and to their own downstream plants, rather than due to any differences in the underlying ex-works price.

129. In order to control for product mix, we disaggregated the data in Figure 21 above further by examining for each Major, the difference between average external and internal prices for seven different product categories for primary aggregates: four for crushed rock, and three for sand and gravel. We also focused our analysis on collected sales to compare ex-works prices in order to ensure that any difference in external and internal prices was not driven by the distances travelled to the customer

or its downstream plant. Our results are set out in Figure 22 below for each of the Majors.

FIGURE 22

Aggregates Division: external and internal prices by product type, FY11

[✂]

Source: Majors' transactions data.
Note: The comparison of average external and internal prices shown in the figures above does not control for other possible factors that may be relevant in pricing, for example controlling for the effects of volume or geography, and, for example, local markets.

130. Figure 22 above shows that for each of the Majors, average prices were higher on internal sales than on external sales across all seven product categories (primary aggregates only) for [✂], [✂], [✂] and [✂]. For [✂], whilst average internal prices were higher for graded crushed rock and dust, and gravel and coarse sand, the reverse was the case for its crushed rock sub-base and fill, and fine sand. We found that when controlling for the effect of product sales mix in this way, average internal prices remained higher than external prices for the vast majority of product categories.

131. [✂] told us that when looking at the differential between external and internal prices, the differential was lower on delivered sales than collected sales, and collected sales volumes may, in some cases, be very small. We note that this analysis does not control for other possible factors that may be relevant in pricing, for example the effects of sales volumes or geography. As explained above, our reason for focusing on collected sales was to control for the effects of different delivery distances on prices. Our analysis does suggest, however, that product sales mix alone was not likely to explain fully the differential between average external and internal prices, and that other factors may be more relevant in explaining these differences.

132. With the results of the above analysis in mind, we examine below the cost structures of the Majors' RMX Divisions, including a discussion on the relative importance of aggregates as a cost to the RMX Division. We then consider the impact of these differences in external and internal aggregates prices on the underlying margins of the Aggregates and RMX Divisions.

RMX Division: cost structures and the importance of materials costs

133. Figure 23 below sets out the cost structures of the Majors' RMX Divisions for FY11 based on the unit cost and the percentage of total costs approaches respectively.

FIGURE 23

Cost structures of the Majors' RMX Divisions, FY11

Cost per unit sold (£/m^3)

[✂]

% of total costs

[✂]

Source: CC analysis of Majors' P&L data.
Note: Other fixed costs include both divisional fixed costs and central costs.

134. Figure 23 above shows that variable costs accounted for the highest proportion of total costs, ranging from [✂] per cent for [✂] (£[✂] per cubic metre) to [✂] per cent for [✂] (£[✂] per cubic metre) and [✂] per cent for [✂] (£[✂] per cubic metre). It is also worth noting that both [✂] and [✂] whose RMX Divisions had the highest unit variable costs, also told us that prices were higher on their internal aggregates sales to their downstream businesses than on their external aggregates sales as a result of their respective transfer pricing policies.

135. The two largest cost components within variable costs are the raw materials costs in relation to aggregates and cement. Table 6 below shows the proportion of variable

costs accounted for by aggregates and cement for each of the Majors' RMX Divisions in FY11.

TABLE 6 **RMX Division: proportion of FY11 variable costs accounted for by aggregates and cement* purchases**

	% of FY11 variable costs	
	Aggregates	*Cement**
Aggregate Industries	[✂]	[✂]
Cemex	[✂]	[✂]
Hanson	[✂]	[✂]
Lafarge	[✂]	[✂]
Tarmac	[✂]	[✂]

Source: Majors' P&L data.

*Given that only [✂] provided a split between cement and cementitious product purchases, we have included both cement and cementitious products under the 'cement' heading.

136. Based on Table 6 above, the cost of purchasing aggregates accounted for between [✂] and [✂] per cent of variable costs in FY11. Cement (including cementitious products, such as GGBS and PFA) accounted for between [✂] and [✂] per cent of variable costs in FY11.

137. Given the relative significance of the costs of purchasing aggregates, we considered that where differences arise between external and internal prices on like-for-like aggregates sales, these could, depending on their materiality, have a significant impact on the underlying margins of both the Aggregates and RMX Divisions concerned.

Aggregates and RMX Divisions: impact of higher internal aggregates prices on upstream profits and downstream costs

138. Given that we had found that internal transfer prices were indeed generally higher than external prices for aggregates,[19] we estimated the incremental financial value of this differential. In order to calculate meaningful underlying margins for the Majors' Aggregates and RMX Divisions, we needed to consider how this incremental value

[19] This could be for a number of reasons, including: *(a)* a conscious policy by a Major to set internal transfer prices at a higher level than external prices; and *(b)* the RMX Division purchasing higher specification (and hence more expensive) aggregates on average than those sold externally. Other factors relevant to pricing decisions may also explain some of these price differences.

arising from differential average prices for internal aggregates sales should be allocated between their Aggregates and RMX divisions. If no allocation were made, the Aggregates Divisions might have higher apparent margins (and the RMX Divisions lower apparent margins) than would be appropriate.

139. We assumed that the incremental value concerned should be allocated to the Aggregates Division only if internal prices were set in line with open market prices (or external prices)—this may mean that the apparently higher internal prices for aggregates were in fact because the RMX Division was purchasing higher specification (and hence more expensive) aggregates on average than were being sold externally. If, however, this was not the case, we assumed that this incremental value should be allocated to the Major's RMX Division, to reflect the fact that it was paying more for its aggregates than might otherwise be the case as a result of the Major's internal transfer pricing policy. We also acknowledged that this might not entirely be a binary allocation decision and that a combination of the two might apply to different extents for each Major. We note that only [✂] and [✂] told us that prices on internal sales were higher than on external sales as a result of their respective transfer pricing policies.

140. In order to estimate this incremental value arising from higher internal prices, we partly controlled for product sales mix by focusing our analysis on the seven product categories of primary aggregates mentioned above. By taking the difference between each product category's average external and internal price and multiplying this difference by its corresponding internal sales volumes, we were able to estimate the incremental value arising from the higher internal price. Figure 24 below sets out our estimates of this incremental financial value for each of the Majors. The underlying calculations of each figure are set out in Appendix G.

FIGURE 24

FY11 incremental value of higher internal aggregates prices (Majors)

[✂]

Source: CC analysis of Majors' transactions data.
Note: These estimates were based entirely on the differential between external and internal prices on seven product categories of primary aggregates and their corresponding internal sales volumes. This figure does not show whether this incremental value of higher internal aggregates prices should be allocated to the Aggregates Division or the RMX Division, or a combination of the two.

141. Figure 24 above estimates that the incremental value of [✂] and [✂] transfer pricing policy was around £[✂] million and £[✂] million respectively. As mentioned above, if internal prices were set at market prices, then this incremental value should remain within the Aggregates Division, ie no further adjustments would be required, as both the Aggregates and RMX Divisions' actual margins would reflect its underlying margins. However, if this is not the case, then this incremental value should be reallocated from the Aggregates to the RMX Division, ie the Aggregates Division's internal revenues and the RMX Division's costs would both fall by this incremental value. As Figure 24 above shows, our estimates of the incremental values for the Majors were relatively substantial, in particular for [✂], [✂] and [✂].

142. We now turn to the margin performance of the Aggregates Division by first examining how each division performed against the market.

Aggregates Division: Majors' sales volume performance vs the market

143. Figure 25 below sets out the performance of the Majors' total sales volumes of aggregates relative to the market over the Relevant Period rebased to 100, using FY07 as the base year.

FIGURE 25

Majors' aggregates sales volumes* vs market (rebased to 100)

[✂]

Source: Majors' P&L data, and Mineral Products Association for market volumes.
*Sales volumes based on total sales, including both external and internal sales.
Note: Market performance based on UK production volumes of primary (ie crushed rock and sand and gravel) and non-primary aggregates.

144. Figure 25 above shows that over the Relevant Period, all of the Majors' sales volumes broadly moved in line with the market, with perhaps the exception of [✂] in FY11, which underperformed the market by seeing a drop in sales volumes compared with the market and the other Majors.

Aggregates Division: Majors' average prices and variable costs vs market

145. Whilst sales volumes have broadly moved in line with the market (as shown in Figure 25 above), as we set out below, average prices have been relatively more stable.

146. Figure 26 below shows the trends in the Majors' unit net revenues (on external sales only) and unit variable cost relative to the market as a whole over the Relevant Period, using FY07 as the base year.

FIGURE 26

Aggregates Division: average price* (external sales) vs variable costs vs market (rebased to 100)

[✂]

Source: Majors' P&L data, and Mineral Products Association for market volumes.
*We adopted net revenue per tonne sold as a proxy for the average price.

147. Figure 26 above shows that for each of the Majors, the sharp decline in market volumes seen in FY09 did not have an effect on average external prices. Average prices appeared relatively stable over the Relevant Period, with some increase seen in FY11 for all of the Majors. However, over the Relevant Period, notwithstanding the

relative stability of average prices, variable costs increased over the Relevant Period, outpacing any changes seen in average prices. [✂] told us that its Aggregates and RMX Divisions' variable costs had risen sharply since FY07, whilst their external prices have remained largely unchanged. It added that this was the result of its customers having a 'wide choice of suppliers, and the significant amount of excess capacity' that existed in both the aggregates and RMX markets following the 'significant fall in market volumes since 2008'.

Aggregates Division: external and internal margins

148. Figure 27 below sets out the variable profit margins (on a return on sales basis) for each of the Majors' Aggregates Divisions over the Relevant Period. Margins on external, internal and combined total sales are shown separately.

FIGURE 27

Aggregates Division: variable profit margins (% of net revenues)

[✂]

Source: Majors' P&L data.
*[✂]

149. We compared margins on external sales for FY08 and FY09 to determine the full-year impact of the downturn in market demand in FY09 on the Majors' margins: [✂].

150. We found that whilst the downturn in market demand had a negative impact on the FY09 external margins of [✂] and [✂], [✂] margin increased, and [✂] and [✂] margin remained broadly stable. In relation to the margin performance of [✂] and [✂], since average prices were largely unaffected by the market downturn, their margin erosion can largely be explained by increases in their unit variable costs, which had outpaced changes in their average external price.

151. Since FY09, however, variable profit margin performance has varied for each of the Majors, with margins declining year-on-year for [✂] and [✂], and margins remaining broadly stable for [✂], [✂] and [✂]: [✂].

152. Figure 28 below shows the EBITDA margins (on a return on sales basis) on external, internal and the combined total sales of the Majors' Aggregates Divisions over the Relevant Period.

FIGURE 28

Aggregates Division: EBITDA margins (% of net revenues)

[✂]

Source: Majors' P&L data.
*[✂]

153. [✂] On a combined total sales basis, all of the Majors made positive EBITDA margins over the Relevant Period, albeit broadly on a downward trend over the Relevant Period. We also noted that the absolute levels of variable profit and EBITDA margins appeared to vary between the Majors. The same analysis but based on variable profit and EBITDA margins on a per unit sold basis showed similar trends. We have therefore not repeated the analysis here, but our results can be found in Appendix E.

154. Both [✂] and [✂] told us that in explaining the differences we saw in margins on external and internal sales of aggregates, product sales mix had an impact on both the revenues and costs associated with external and internal margins:

(a) [✂] told us that in addition to differences between its external and internal prices, a large proportion of its external sales related to granular fills and sub-bases which required less processing than graded or washed material which were more frequently sold internally to its RMX Division and asphalt operations.

(b) [✂] told us that: [✂]. It added that whilst its internal sales, with the exception of some limited recycled materials, would attract the Aggregates Levy, a significant proportion of its external sales would be exempt given that these sales were for 'relieved' end-uses, for example chemical processes and agricultural lime customers.

155. We now turn to the cost structures of the Majors' Aggregates Divisions, which together with differences in their average prices largely explain the differences in their margin levels, not only between the Majors' Aggregates Divisions, but also between each Major's sites.

Aggregates Division: cost structures

156. Figure 29 below sets out the cost structures of the Majors' Aggregates Divisions based on FY11 figures based on the unit cost and percentage of total costs approaches respectively.

FIGURE 29

Cost structures of the Majors' Aggregates Divisions, FY11

Cost per unit sold (£/t)

[✂]

% of total costs

[✂]

Source: CC analysis of Majors' P&L data.
Note: Other fixed costs include both divisional fixed costs and central costs.

157. Unlike the symmetry that we found in the cost structures of the Majors' Cement Divisions, Figure 29 above shows that there is significant variation in cost structures between the Majors' Aggregates Division, including at the variable cost level, which ranged from [✂] per cent of total costs for [✂] and [✂] per cent for [✂], to between

[✂] and [✂] per cent for [✂], [✂] and [✂]. The unit variable cost ranged from £[✂] (for [✂]) to £[✂] (for [✂]) per tonne sold.

158. Given the relatively wide range of product categories for aggregates, we considered it appropriate to assess cost structures at a site level in order to control our analysis for the various different product categories.

159. In Appendix H, we set out the cost structures of the top ten aggregates sites (by FY11 production volumes) for each of the Majors. For the purposes of this analysis, the product categories we used were: crushed rock, sand and gravel (both land-won and marine), recycled, secondary and specialist aggregates. Our cost structure assessment focused on each site's distribution costs, variable costs and site fixed costs, since some of the Majors had not allocated divisional fixed costs or central costs to each individual site, instead accounting for them as a divisional consolidation adjustment. The methodology we used to assess the sites' cost structures was the unit cost approach.

160. Based on the results of our analysis in Appendix H, we found that each site we selected typically produced either crushed rock or sand and gravel, together with one or more of the other product categories, eg recycled or specialist aggregates. We found that there were significant variations between unit costs even for sites which produced a single product category. For example, [✂], their unit variable costs were £[✂] and £[✂] respectively. Another example is for [✂] crushed rock only quarries, where the unit variable cost for each site was £[✂] for [✂], £[✂] for [✂], £[✂] for [✂], £[✂] for [✂], £[✂] for [✂] and £[✂] for [✂].

161. We also examined whether sand and gravel pits had lower costs than crushed rock quarries. Based on Appendix H, we did not find a consistent pattern between the

relative cost levels of crushed rock and sand and gravel sites. For example, for [✂], the unit variable cost and unit site fixed cost for its [✂] was £[✂] and £[✂] respectively. Whilst the respective unit cost ratios for [✂] at £[✂] and £[✂] respectively, [✂]. We therefore found that there was limited symmetry and transparency in cost structures when comparing the cost structures associated with different product categories, and also when comparing the cost structures associated with a specific product category.

RMX Division: margin overview

162. We now turn to the margin performance of the RMX Division. When calculating margins on the Majors' RMX Divisions, all sales were classified as external sales given the immateriality of internal sales volumes as a proportion of total sales.

RMX Division: Majors' sales volume performance vs the market

163. In Figure 30 below, we set out the performance of the Majors' total sales volumes of RMX relative to the market over the Relevant Period, all rebased to 100, using FY07 as the base year.

FIGURE 30

Majors' RMX sales volumes* vs market (rebased to 100)

[✂]

Source: Majors' P&L data, and Mineral Products Association for market volumes.
*All RMX sales were classified as external sales given the immateriality of internal sales volumes as a proportion of total sales.
Note: Market performance based on RMX production volumes in the UK.

164. Figure 30 above shows that RMX market volumes have declined year-on-year from FY07 to FY09, with volumes picking up slightly by FY11 compared with FY09 levels. The Majors' RMX Divisions' sales volumes broadly performed in line with the market, with perhaps the exception of [✂], whose sales volumes [✂], suffered relatively less of a decline than the other Majors.

RMX Division: Majors' average prices and variable costs vs market

165. Figure 31 below shows how the Majors' RMX Divisions' average prices and variable costs have performed over the Relevant Period, using FY07 as the base year.

FIGURE 31

RMX Division: average price vs variable costs vs market (rebased to 100)

[✂]

Source: Majors' P&L data, and Mineral Products Association for market volumes.
*We adopted net revenue per tonne sold as a proxy for the average price.
Note: Market performance based on RMX production volumes in the UK.

166. Figure 31 above shows that average RMX prices have generally increased over the Relevant Period, such that, compared with FY07 average prices, FY11 average prices were higher by: [✂] per cent for [✂], [✂] per cent for [✂], [✂] per cent for [✂], and [✂] per cent for [✂] and [✂]. However, we found that unit variable costs increased at a greater pace over this period, resulting in an erosion of their variable profit margins.

RMX Division: margins

167. Figure 32 below sets out the variable profit margins (on a return on sales basis) for the Majors' RMX Divisions over the Relevant Period. As noted above, we treated all RMX sales as external sales.

FIGURE 32

RMX Division: variable profit margins (% of net revenues)

[✂]

Source: Majors' P&L data.
Note: The variable profit margins shown above were based on no adjustments to the Majors' P&L data to take into account any impact of pricing differential between external and internal aggregates sales.

168. Figure 32 above shows that the Majors' RMX Divisions generally saw a decline in their margins in FY09 on prior year levels, where [✂] margin fell from [✂] to [✂] per cent; [✂] margin from [✂] to [✂] per cent; [✂] margin from [✂] to [✂] per cent;

[✂] margin from [✂] to [✂] per cent; and [✂] margin from [✂] to [✂] per cent. Margins increased slightly in FY11 for all of the Majors in FY11, with the exception of [✂], whose margin remained flat on prior year levels. A similar trend can be seen for the RMX Divisions' EBITDA margins and these are shown in Appendix F. Our assessment of EBITDA margins based on a unit margin basis showed a similar trend and therefore this analysis is not repeated here. The results of this analysis, however, can be found in Appendix F.

169. In Figure 24 above, we estimated the incremental value arising from higher internal prices for aggregates sold by the upstream Aggregates Division, and stated that where internal prices were higher than external prices as a result of a company's transfer pricing policy, the incremental value should be allocated to the downstream divisions. Whilst noting that only [✂] and [✂] told us that they adopted this transfer pricing policy, on the assumption that all of the Majors priced internal aggregates sales higher than external sales, we assessed the impact of this on variable profit margins based on allocating the incremental value arising from higher internal aggregates prices to each RMX Division's variable profits.

170. Table 7 below sets out the Majors' estimates of FY11 internal aggregates sales volumes to their own RMX Divisions and other downstream businesses, for example the production and sale of asphalt and building products.

TABLE 7 **FY11 proportion of internal aggregates sales volumes purchased internally by the RMX Division**

	Sales to RMX Mt	*Sales to other Mt*	*RMX %*	*Other %*
Aggregate Industries	[✂]	[✂]	[✂]	[✂]
Cemex	[✂]	[✂]	[✂]	[✂]
Hanson	[✂]	[✂]	[✂]	[✂]
Lafarge	[✂]	[✂]	[✂]	[✂]
Tarmac	[✂]	[✂]	[✂]	[✂]

Source: Majors.

*The heading 'sales to other' refers to internal aggregates sales volumes to the Majors' downstream businesses other than the RMX Division, eg in asphalt or building products.
Note: We were unable to calculate these figures from the Majors' transactions data given the limitations in their data.

171. Based on Table 7 above, we applied the proportion of each Major's internal aggregates sales volumes accounted for by the RMX Division and applied this to that Major's corresponding incremental value, which we calculated earlier in Figure 24 above to arrive at an estimated allocation figure for the RMX Division's margins in FY11.

172. Figure 33 below shows the FY11 variable profit margin for each of the Majors' RMX Divisions both excluding and including the allocation of this incremental value.

FIGURE 33

RMX Division: FY11 variable profit margins (% of net revenues) adjusted by an allocation of the financial impact of higher internal aggregates prices

[✂]

Source: Majors' P&L data and transactions data.
Note: Each Major's incremental value arising from internal aggregates prices being higher than external aggregates prices was allocated to its RMX Division based on the proportion of total internal sales volumes of aggregates that went into its RMX production.

173. As Figure 33 above shows, in percentage point terms, the adjustment makes a relatively significant impact on the margins of [✂] and [✂], where margins increase from [✂] to [✂] per cent for [✂] and from [✂] to [✂] per cent for [✂]. The variable profit margins of the RMX Divisions of [✂], [✂] and [✂] increase by a smaller amount, by between [✂] and [✂] percentage points, as a result of making this adjustment.

174. Figure 34 below shows the impact of this adjustment on the FY11 EBITDA margins of the Majors' RMX Divisions.

FIGURE 34

RMX Division: FY11 EBITDA margins (% of net revenues) adjusted by the financial impact of higher internal aggregates prices

[✂]

Source: Majors' P&L data and transactions data.
Note: Each Major's incremental value arising from internal aggregates prices being higher than external aggregates prices was allocated to its RMX Division based on the proportion of total internal sales volumes of aggregates that went into its RMX production.

175. As Figure 34 above shows, the adjustment [✂] for [✂] and [✂], and [✂] for [✂], [✂] and [✂].

Impact of higher internal aggregates prices on the Majors' financial reporting

176. We finally examine the implications of higher internal aggregates prices on the Majors' financial reporting.

177. Table 8 below shows the primary reporting entities for each Major's Relevant GB Operations.

TABLE 8 **Primary reporting entities of the Majors' Relevant GB Operations**

	Aggregate Industries	*Cemex*	*Hanson*	*Lafarge*	*Tarmac*
Aggregates and RMX Divisions*	Aggregate Industries UK Ltd	Cemex UK Materials Ltd	Hanson Quarry Products Europe Ltd	Lafarge Aggregates Ltd	Tarmac Ltd
Cement Division	N/A	Cemex UK Cement Ltd	Castle Cement Ltd	Lafarge Cement UK Ltd	Tarmac Ltd

Source: Majors FQ.

*Excluding marine aggregates. In relation to Lafarge, however, wholly-owned wharves which process marine aggregates, as well as shares in joint ventures which operate dredgers, are included within Lafarge Aggregates Limited.
†The legal entities for Cemex shown in this table operate as agents on behalf of Cemex's primary operating subsidiary, Cemex UK Operations Ltd, which is recharged for each agent's services.
Note: N/A means not applicable.

178. As Table 8 above shows, the Aggregates and RMX Divisions form part of the same legal and financial reporting entity for each of the Majors. Only Tarmac's Cement Division formed part of the same legal entity as its Aggregates and RMX Divisions, whilst the other three cement-producing Majors' Cement Divisions formed part of a separate legal entity. On this basis, for Cemex, Hanson and Lafarge, any differences

in the external and internal price of cement would have an impact on the reported revenues of their Cement Divisions, as well as on their reported costs, as a result of their RMX Divisions' internal purchases of cement. As we found earlier in this paper (see Figure 15 above), the average internal price was broadly in line with the average external price for all of the cement-producing Majors.

179. However, any differences in the external and internal price of aggregates (on like-for-like products) arising from a transfer pricing policy to inflate internal prices would have the following impact on a reporting entity's figures (noting that the Aggregates and RMX Divisions form part of the same reporting entity):

(a) higher internal prices would increase reported revenues as the result of an increase in the Aggregate Division's internal revenues; and

(b) higher internal procurement costs of aggregates by the RMX Divisions would increase reported costs.

180. When taken together, the higher internal revenues for the Aggregates Division are offset by the higher procurement costs of the RMX Division. Therefore, there is no net effect of the two on combined profits.

181. Since there is no net effect on combined profits arising from higher internal transfer prices for aggregates and higher internal costs for the RMX Division, we examined the reasons why such a policy might be adopted:

- [✂] told us that it put a higher price on internal sales of aggregates to prevent excessive discounting by its RMX sales force, which was very margin-aware.
- [✂] told us that its policy was to set an internal transfer price for aggregates that would recover inflation in [✂] cost base. According to [✂], if external prices then fell, this could result in the internal price being higher than the external price. [✂] further pointed out that its internal transfer pricing policy for aggregates did not

affect competition in the RMX market, as RMX pricing was market based, not cost-plus. However, [✂] noted that its internal pricing policy for aggregates did adversely affect the profitability of its RMX business.

- [✂], [✂] and [✂] told us that they tried to set their internal transfer price for aggregates to be as close as possible to the market price.

182. [✂] made several arguments in relation to assessing profitability of a vertically integrated firm, and how vertical integration might increase price efficiency. Our consideration of its arguments in relation to profitability is set out separately in our assessment on the Majors' profitability. In this paper, we consider [✂].

183. [✂]

184. The 'double marginalization effect' can arise where both upstream and downstream firms that are not under common ownership, price such that they each earn a margin, which leads to higher prices to customers of the final product, and lower profits overall. Under this scenario, by vertically integrating the upstream and downstream firms, the profit-maximizing pricing decision can be made centrally, allowing the elimination of the 'double marginalization effect' and resulting in higher profits overall and lower prices to end-consumers.

185. However, the 'double-marginalization effect' only holds if both upstream and downstream firms have some market power, and if competition in the RMX market was effective, ie no firm has considerable market power, then we did not consider it likely that the 'double-marginalization effect' would occur in the first place.

186. Related to the above point, in relation to the differences we found between external and internal prices of aggregates, we considered that if competition were otherwise

effective in the supply of RMX, we did not think that the transfer pricing policy adopted by vertically integrated firms that resulted in internal prices of aggregates being sometimes higher than external prices were likely, on their own, to have a material effect on competition in RMX.

The Majors' Cement Division: P&L data

1. This appendix sets out the P&L data, simplified to show the main headings we used for our assessment, for each of the Majors' Cement Divisions.

Cemex

2. Cemex's simplified P&L data is set out below.

TABLE A1 **Cemex: Cement Division—simplified P&L data**

	FYE 31 December						
	2005	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
Sales volumes (Mt)							
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Gross revenues							
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
*Distribution costs**							
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Net revenues							
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Variable costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Variable profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Site fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Site profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Divisional fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA (before central costs)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Central costs†	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Depreciation and amortization	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBIT	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Source: P&L data.

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*[✂]
†[✂]
Note: [✂].

Hanson

3. Hanson's simplified P&L data is set out below.

TABLE A2 **Hanson: Cement Division—simplified P&L data**

	FYE 31 December				
	2007	*2008*	*2009*	*2010*	*2011*
Sales volumes (Mt)					
External	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]
Gross revenues					
External	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]
Distribution costs					
External	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]
Net revenues					
External	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]
Variable costs	[✂]	[✂]	[✂]	[✂]	[✂]
Variable profit	[✂]	[✂]	[✂]	[✂]	[✂]
Site fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]
Site profit	[✂]	[✂]	[✂]	[✂]	[✂]
Divisional fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA (before central costs)	[✂]	[✂]	[✂]	[✂]	[✂]
Central costs*	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA	[✂]	[✂]	[✂]	[✂]	[✂]
Depreciation and amortization	[✂]	[✂]	[✂]	[✂]	[✂]
EBIT	[✂]	[✂]	[✂]	[✂]	[✂]

Source: P&L data.

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*[✂]
Note: [✂].

Lafarge

4. Lafarge's simplified P&L data is set out below.

TABLE A3 **Lafarge: Cement Division—simplified P&L data**

	FYE 31 December						
	2005	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
Sales volumes (Mt)							
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Gross revenues							
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Distribution costs							
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Net revenues							
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Variable costs*	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Variable profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Site fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Site profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Divisional fixed costs†	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA (before central costs)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Central costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Depreciation and amortization	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBIT	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Source: P&L data.

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*[✂]
†[✂]
Note: [✂].

Tarmac

5. Tarmac's simplified P&L data is set out below.

TABLE A4 **Tarmac: Cement Division—simplified P&L data**

	FYE 31 December					
	2006	*2007*	*2008*	*2009*	*2010*	*2011*
Sales volumes (Mt)						
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Gross revenues						
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Distribution costs						
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Net revenues						
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Variable costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Variable profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Site fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Site profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Divisional fixed costs*	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA (before central costs)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Central costs*	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Depreciation and amortization	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBIT	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Source: P&L data.

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*[✂]
Note: [✂].

The Majors' Aggregates Division: P&L data

1. This appendix sets out the P&L data, simplified to show the main headings we used for our assessment, for each of the Majors' Aggregates Divisions.

Aggregate Industries

2. Aggregate Industries' simplified P&L data is set out below.

TABLE B1 **Aggregate Industries: Aggregates Division—simplified P&L data**

	FYE 31 December						
	2005	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
Sales volumes (Mt)							
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Gross revenues							
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Distribution costs							
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Net revenues							
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Variable costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Variable profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Site fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Site profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Divisional fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA (before central costs)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Central costs*	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Depreciation and amortization	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBIT	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Source: P&L data.

*[✂]
Notes: [✂].

Cemex

3. Cemex's simplified P&L data is set out below.

TABLE B2 **Cemex: Aggregates Division—simplified P&L data**

	FYE 31 December				
	2007	*2008*	*2009*	*2010*	*2011*
Sales volumes (Mt)					
External	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]
Gross revenues					
External	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]
*Distribution costs**					
External	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]
Net revenues					
External	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]
Variable costs	[✂]	[✂]	[✂]	[✂]	[✂]
Variable profit	[✂]	[✂]	[✂]	[✂]	[✂]
Site fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]
Site profit	[✂]	[✂]	[✂]	[✂]	[✂]
Divisional fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA (before central costs)	[✂]	[✂]	[✂]	[✂]	[✂]
Central costs†	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA	[✂]	[✂]	[✂]	[✂]	[✂]
Depreciation and amortization	[✂]	[✂]	[✂]	[✂]	[✂]
EBIT	[✂]	[✂]	[✂]	[✂]	[✂]

Source: P&L data.

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*[✂]
†[✂]
Notes: [✂].

Hanson

4. Hanson's simplified P&L data is set out below.

TABLE B3 **Hanson: Aggregates Division—simplified P&L data**

	FYE 31 December				
	2007	*2008*	*2009*	*2010*	*2011*
Sales volumes (Mt)					
External	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]
Gross revenues					
External	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]
Distribution costs					
External	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]
Net revenues					
External	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]
Variable costs	[✂]	[✂]	[✂]	[✂]	[✂]
Variable profit	[✂]	[✂]	[✂]	[✂]	[✂]
Site fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]
Site profit	[✂]	[✂]	[✂]	[✂]	[✂]
Divisional fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA (before central costs)	[✂]	[✂]	[✂]	[✂]	[✂]
Central costs	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA	[✂]	[✂]	[✂]	[✂]	[✂]
Depreciation and amortization	[✂]	[✂]	[✂]	[✂]	[✂]
EBIT	[✂]	[✂]	[✂]	[✂]	[✂]

Source: P&L data.

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*[✂]
Notes: [✂]

Lafarge

5. Lafarge's simplified P&L data is set out below.

TABLE B4 **Lafarge: Aggregates Division—simplified P&L data**

	FYE 31 December						
	2005	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
Sales volumes (Mt)							
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Gross revenues							
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Distribution costs							
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Net revenues							
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Variable costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Variable profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Site fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Site profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Divisional fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA (before central costs)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Central costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Depreciation and amortization	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBIT	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Source: P&L data.

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*[✂]
†[✂]
Notes: [✂].

Tarmac

6. Tarmac's simplified P&L data is set out below.

TABLE B5 **Tarmac: Aggregates Division—simplified P&L data**

FYE 31 December

	2006	*2007*	*2008*	*2009*	*2010*	*2011*
Sales volumes (Mt)						
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Gross revenues						
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Distribution costs						
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Net revenues						
External	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Internal	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Variable costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Variable profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Site fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Site profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Divisional fixed costs*	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA (before central costs)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Central costs*	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Depreciation and amortization	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBIT	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

S*ource:* P&L data.

---

*[✂]
Note: [✂]

The Majors' RMX Division: P&L data

1. This appendix sets out the P&L data, simplified to show the main headings we used for our assessment, for each of the Majors' RMX Divisions.

Aggregate Industries

2. Aggregate Industries' simplified P&L data is set out below.

TABLE C1 **Aggregate Industries: RMX Division—simplified P&L data**

	FYE 31 December						
	2005	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
Sales volumes (m m^3)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Gross revenues	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Distribution costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Net revenues	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Variable costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Variable profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Site fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Site profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Divisional fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA (before central costs)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Central costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Depreciation and amortization	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBIT	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Source: P&L data.

*We assumed that all RMX sales were external sales.
Note: [✂].

Cemex

3. Cemex's simplified P&L data is set out below.

TABLE C2 **Cemex: RMX Division—simplified P&L data**

	FYE 31 December				
	2007	*2008*	*2009*	*2010*	*2011*
Sales volumes (m m^3)*	[✂]	[✂]	[✂]	[✂]	[✂]
Gross revenues	[✂]	[✂]	[✂]	[✂]	[✂]
Distribution costs	[✂]	[✂]	[✂]	[✂]	[✂]
Net revenues	[✂]	[✂]	[✂]	[✂]	[✂]
Variable costs	[✂]	[✂]	[✂]	[✂]	[✂]
Variable profit	[✂]	[✂]	[✂]	[✂]	[✂]
Site fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]
Site profit	[✂]	[✂]	[✂]	[✂]	[✂]
Divisional fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA (before central costs)	[✂]	[✂]	[✂]	[✂]	[✂]
Central costs	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA	[✂]	[✂]	[✂]	[✂]	[✂]
Depreciation and amortization	[✂]	[✂]	[✂]	[✂]	[✂]
EBIT	[✂]	[✂]	[✂]	[✂]	[✂]

Source: P&L data.

*We assumed that all RMX sales were external sales.

Hanson

4. Hanson's simplified P&L data is set out below.

TABLE C3 **Hanson: RMX Division—simplified P&L data**

	FYE 31 December				
	2007	*2008*	*2009*	*2010*	*2011*
Sales volumes (m m^3)	[✂]	[✂]	[✂]	[✂]	[✂]
Gross revenues	[✂]	[✂]	[✂]	[✂]	[✂]
Distribution costs	[✂]	[✂]	[✂]	[✂]	[✂]
Net revenues	[✂]	[✂]	[✂]	[✂]	[✂]
Variable costs	[✂]	[✂]	[✂]	[✂]	[✂]
Variable profit	[✂]	[✂]	[✂]	[✂]	[✂]
Site fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]
Site profit	[✂]	[✂]	[✂]	[✂]	[✂]
Divisional fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA (before central costs)	[✂]	[✂]	[✂]	[✂]	[✂]
Central costs*	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA	[✂]	[✂]	[✂]	[✂]	[✂]
Depreciation and amortization	[✂]	[✂]	[✂]	[✂]	[✂]
EBIT	[✂]	[✂]	[✂]	[✂]	[✂]

Source: P&L data.

*[✂]

Lafarge

5. Lafarge's simplified P&L data is set out below.

TABLE C4 **Lafarge: RMX Division—simplified P&L data**

	FYE 31 December				
	2007	*2008*	*2009*	*2010*	*2011*
Sales volumes (m m^3)	[✂]	[✂]	[✂]	[✂]	[✂]
Gross revenues	[✂]	[✂]	[✂]	[✂]	[✂]
Distribution costs	[✂]	[✂]	[✂]	[✂]	[✂]
Net revenues	[✂]	[✂]	[✂]	[✂]	[✂]
Variable costs	[✂]	[✂]	[✂]	[✂]	[✂]
Variable profit	[✂]	[✂]	[✂]	[✂]	[✂]
Site fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]
Site profit	[✂]	[✂]	[✂]	[✂]	[✂]
Divisional fixed costs*	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA (before central costs)	[✂]	[✂]	[✂]	[✂]	[✂]
Central costs*	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA	[✂]	[✂]	[✂]	[✂]	[✂]
Depreciation and amortization	[✂]	[✂]	[✂]	[✂]	[✂]
EBIT	[✂]	[✂]	[✂]	[✂]	[✂]

Source: P&L data.

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*[✂]
Note: [✂]

Tarmac

6. Tarmac's simplified P&L data is set out below.

TABLE C5 **Tarmac: RMX Division—simplified P&L data**

	FYE 31 December					
	2006	*2007*	*2008*	*2009*	*2010*	*2011*
Sales volumes (m m^3)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Gross revenues	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Distribution costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Net revenues	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Variable costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Variable profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Site fixed costs	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Site profit	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Divisional fixed costs*	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA (before central costs)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Central costs*	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBITDA	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Depreciation and amortization	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBIT	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Source: P&L data.

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*[✂]

Cement Divisional margins: variable profit and EBITDA per tonne sold

1. This appendix sets out the variable profit and EBITDA unit margins for each of the Majors' Cement Divisions.

2. Figure D1 sets out the variable profit unit margins for each of the Majors' Cement Divisions.

FIGURE D1

Cement Division: variable profit margins (£/t)

[✂]

Source: Majors' P&L data and transactions data.

3. Figure D2 sets out the EBITDA unit margins for each of the Majors' Cement Divisions.

FIGURE D2

Cement Division: EBITDA margins (£/t)

[✂]

Source: Majors' P&L data and transactions data.

Aggregates Divisional margins: variable profit and EBITDA per tonne sold

1. This appendix sets out the variable profit and EBITDA unit margins for each of the Majors' Aggregates Divisions.

2. Figure E1 sets out the variable profit unit margins for each of the Majors' Aggregates Divisions.

FIGURE E1

Aggregates Division: variable profit margins (£/t)

[✂]

Source: Majors' P&L data and transactions data.

3. Figure E2 sets out the EBITDA unit margins for each of the Majors' Aggregates Divisions.

FIGURE E2

Aggregates Division: EBITDA margins (£/t)

[✂]

Source: Majors' P&L data and transactions data.

RMX Divisional margins: variable profit and EBITDA per cubic metre sold

RMX Division

1. This appendix sets out the EBITDA (on a return on sales basis) and variable profit and EBITDA unit margins for each of the Majors' RMX Divisions.

2. Figure F1 sets out the EBITDA margin (as a percentage of net revenues) for each of the Majors' RMX Divisions.

FIGURE F1

RMX Division: EBITDA margins (% of net revenues)

[✂]

Source: Majors' P&L data and transactions data.

3. Figure F2 sets out the variable profit unit margins for each of the Majors' RMX Divisions.

FIGURE F2

RMX Division: variable profit margins (£/m^3)

[✂]

Source: Majors' P&L data and transactions data.

4. Figure F3 sets out the EBITDA unit margins for each of the Majors' RMX Divisions.

FIGURE F3

RMX Division: EBITDA margins (£/m^3)

[✂]

Source: Majors' P&L data and transactions data.

Estimation of the financial impact of higher internal aggregates prices

Aggregate Industries

1. Table G1 sets out the calculations of the financial impact arising from higher prices on internal sales of aggregates.

TABLE G1 **Aggregate Industries: estimation of the financial impact of higher internal aggregates prices†**

	£/t		*Kt*		*£'000*		*£'000*
	*Internal price premium**		*Internal sales volumes*		*Impact on upstream profit*		
	Collected	*Delivered*	*Collected*	*Delivered*	*Collected*	*Delivered*	*Total benefit*
CR: Graded	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
CR: Sub-base	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
CR: Fill	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
CR: Dust	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
SG: Gravel	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
SG: Fine sand	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
SG: Coarse sand	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
					[✂]	[✂]	[✂]

Source: P&L data.

*Positive figures where internal prices are greater than external prices, and vice versa.
†[✂]

Cemex

2. Table G2 sets out the calculations of the financial impact arising from higher prices on internal sales of aggregates.

TABLE G2 **Cemex: estimation of the financial impact of higher internal aggregates prices**

	*Internal price premium** *£/t*		*Internal sales volumes* *Kt*		*Impact on upstream profit* *£'000*		*£'000*
	Collected	*Delivered*	*Collected*	*Delivered*	*Collected*	*Delivered*	*Total benefit*
CR: Graded	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
CR: Sub-base	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
CR: Fill	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
CR: Dust	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
SG: Gravel	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
SG: Fine sand	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
SG: Coarse sand	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
					[✂]	[✂]	[✂]

Source: P&L data.

*Positive figures where internal prices are greater than external prices, and vice versa.

Hanson

3. Table G3 sets out the calculations of the financial impact arising from higher prices on internal sales of aggregates.

TABLE G3 **Hanson: estimation of the financial impact of higher internal aggregates prices**

	Internal price premium £/t*		*Internal sales volumes Kt*		*Impact on upstream profit £'000*		*£'000*
	Collected	*Delivered*	*Collected*	*Delivered*	*Collected*	*Delivered*	*Total benefit*
CR: Graded	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
CR: Sub-base	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
CR: Fill	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
CR: Dust	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
SG: Gravel	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
SG: Fine sand	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
SG: Coarse sand	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
					[✂]	[✂]	[✂]

Source: P&L data.

*Positive figures where internal prices are greater than external prices, and vice versa.

Lafarge

4. Table G4 sets out the calculations of the financial impact arising from higher prices on internal sales of aggregates.

TABLE G4 **Lafarge: estimation of the financial impact of higher internal aggregates prices**

	Internal price premium £/t*		*Internal sales volumes Kt*		*Impact on upstream profit £'000*		*£'000*
	Collected	*Delivered*	*Collected*	*Delivered*	*Collected*	*Delivered*	*Total benefit*
CR: Graded	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
CR: Sub-base	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
CR: Fill	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
CR: Dust	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
SG: Gravel	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
SG: Fine sand	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
SG: Coarse sand	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
					[✂]	[✂]	[✂]

Source: P&L data.

*Positive figures where internal prices are greater than external prices, and vice versa.

Tarmac

5. Table G5 sets out the calculations of the financial impact arising from higher prices on internal sales of aggregates.

TABLE G5 **Tarmac: estimation of the financial impact of higher internal aggregates prices**

	Internal price premium £/t*		*Internal sales volumes Kt*		*Impact on upstream profit £'000*		*£'000*
	Collected	*Delivered*	*Collected*	*Delivered*	*Collected*	*Delivered*	*Total benefit*
CR: Graded	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
CR: Sub-base	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
CR: Fill	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
CR: Dust	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
SG: Gravel	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
SG: Fine sand	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
SG: Coarse sand	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	
					[✂]	[✂]	[✂]

Source: P&L data.

*Positive figures where internal prices are greater than external prices, and vice versa.

Cost structures of the Majors' aggregates sites

1. This appendix sets out the cost structures of the top ten aggregates sites (by FY11 production volumes) for each of the Majors.

2. Table H1 below shows that the top ten aggregates sites accounted for between [✂] and [✂] per cent of an Aggregates Division's total FY11 production volumes.

TABLE H1 **Percentage of FY11 Divisional production volumes accounted for by the top ten aggregates sites (by Major)**

	Top 10 volumes	*Divisional volumes*	*% by top 10 Sites*
Aggregate Industries	[✂]	[✂]	[✂]
Cemex	[✂]	[✂]	[✂]
Hanson (9 sites)*	[✂]	[✂]	[✂]
Lafarge	[✂]	[✂]	[✂]
Tarmac	[✂]	[✂]	[✂]

Source: P&L data.

*[✂]

Aggregate Industries

3. The cost structures of Aggregate Industries' top ten aggregates sites (by FY11 production volumes) are set out below.

FIGURE H1

Aggregate Industries: cost structures of the top ten aggregates sites

[✂]

Source: P&L data.
Note: Definition of acronyms used: CR: crushed rock; SG: sand and gravel; marine: marine aggregates; Rec: recycled aggregates; Sec: secondary aggregates; and Sp: specialist aggregates.

Cemex

4. The cost structures of Cemex's top ten aggregates sites (by FY11 production volumes) are set out below.

FIGURE H2

Cemex: cost structures of the top ten aggregates sites

[✂]

Source: P&L data.
Note: Definition of acronyms used: CR: crushed rock; SG: sand and gravel; marine: marine aggregates; Rec: recycled aggregates; Sec: secondary aggregates; and Sp: specialist aggregates.

Hanson

5. The cost structures of Hanson's top nine aggregates sites (by FY11 production volumes) are set out below. [✂]

FIGURE H3

Hanson: cost structures of the top nine aggregates sites

[✂]

Source: P&L data.
Note: Definition of acronyms used: CR: crushed rock; SG: sand and gravel; marine: marine aggregates; Rec: recycled aggregates; Sec: secondary aggregates; and Sp: specialist aggregates.

Lafarge

6. The cost structures of Lafarge's top ten aggregates sites (by FY11 production volumes) are set out below.

FIGURE H4

Lafarge: cost structures of the top ten aggregates sites

[✂]

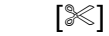
Source: P&L data.
Note: Definition of acronyms used: CR: crushed rock; SG: sand and gravel; marine: marine aggregates; Rec: recycled aggregates; Sec: secondary aggregates; and Sp: specialist aggregates.

Tarmac

7. The cost structures of Tarmac's top ten aggregates sites (by FY11 production volumes) are set out below.

FIGURE H5

Tarmac: cost structures of the top ten aggregates sites



Source: P&L data.
Note: Definition of acronyms used: CR: crushed rock; SG: sand and gravel; marine: marine aggregates; Rec: recycled aggregates; Sec: secondary aggregates; and Sp: specialist aggregates. [✂]