

Small Subcontractors in UK Engineering: Competitiveness, Dependence and Problems

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ABSTRACT. This paper reports the results of a new survey of small subcontractors in UK engineering. We are able to characterise the main source of competitive advantage as being experience with a particular technology. Labour flexibility, but not cheap labour, is also a necessary condition for success. There is a clear trend towards limited concentration of one third of all output with the single most important customer. More negatively, there is evidence for substantial avoidance of ideal, relationship specific investments, and for lack of communication and trust. This is despite the fact that most subcontractors are located close to their customers and have been serving them for many years.

I. Introduction

There is now a widespread acceptance that subcontracting is an important, if under-researched, aspect of small firm activity (Imrie, 1986). Particular interest has centred around flexibility and the technological context behind the apparent increase in subcontracting activity (e.g. Piore and Sabel, 1984). The motivation behind decisions to subcontract as opposed to producing in-house is also at the heart of some important recent theoretical developments (e.g. Williamson, 1985). For example, Williamson has highlighted the dangers of opportunistic behaviour, and the adverse implications of buying-in inputs for the incentive to invest in transaction specific assets.

Despite the growing acceptance of transaction cost theory (reinforced by Coase's recent Nobel Prize), there is very little non-anecdotal evidence

relating to the key characteristics that the theory highlights as crucial to the organization of production. What evidence there is, is almost exclusively for the US, and this paper reports the first broad based results for European industry. We identify the strategic vulnerability of small firms, which is to say their exposure to the consequences of arbitrary decisions by their customers; and go on to assess whether potential vulnerability has any real effect on a range of investments. We pay particular attention to the empirical consequences of small size.

We also investigate some other key issues of policy importance, such as: what are the sources of small subcontractor competitiveness, and what problems do they encounter in their dealings with important customers?

Answers to these and other questions are provided by a postal questionnaire sent to a large number of subcontractors in the UK engineering industries. The next section describes the database, and the following three sections pick up on competitiveness, vulnerability (including dependence and the consequences for investment) and problems.

II. The questionnaire

The questionnaire was sent to a random sample of 1000 small firms listed on a commercial database provided by Findlay Publications. The sample was stratified by size, such that we ended up with roughly equal numbers of firms employing 1–9, 10–19, 20–39, and 40–99 employees. The Findlay database is an extensively researched list of firms which classify themselves as involved in subcontracting. It is collected and regularly updated with a view to sending a free magazine,

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Machinery which has a regular subcontracting supplement, to a targeted list of *named* managers who are responsible for undertaking subcontracting work. The commercial payoff to this list is primarily to sell precisely targeted advertising, but the addresses are also exploitable for academic research.

We received 103 responses, 91 of which were from small businesses which produce at least part of their output "to a specification or design which is specialised to individual customer requirements (e.g. shaped metal casing, but not standard sheet steel; e.g. customised computer software, but not standard microchips; e.g. customised electronic controls, but not standard electric motors; e.g. specialised ceramics, but not off-the-shelf chemicals)". [The quote is from the questionnaire.] All of the results reported here relate only to the 91 who make at least some customised output. Thus, we use the following definition: *a subcontractor is a firm which produces output to a specification or design which is specialised to individual customer requirements*. Of course, there are numerous alternative definitions, but this one was chosen as the most relevant to the exploration of issues raised by Williamson's transaction cost framework.

It may seem that a 10% response rate is fairly poor. However, this can largely be explained by the fact that producers of standard products undoubtedly represent more than 12% (= 12/103) of the population of firms which classify themselves as subcontractors. The questionnaire was designed to be meaningful only for producers of specialised products. In fact, firms were asked not to complete the questionnaire if their product was the same for different customers. The questionnaire was conducted in early March 1991, which it is now clear was a period of deep and increasing recession in the UK with many small firms facing bankruptcy. If there was a response bias, then, it might be that the less successful firms, fighting for their lives, were less likely to fill in a form.¹ It is worth noting that the completeness of responses was excellent. All the statistics reported in this paper are based on at least 89 replies unless stated otherwise. Finally, we also conducted a complementary series of 20 face-to-face interviews, half with subcontractors and half with purchasing firms. These interviews were struc-

tured around the postal questionnaire and have been used to clarify the postal answers. The statistics reported in this paper relate only to the postal responses.²

Replies came from each of the standard British regions, with strongest representation from the South East (25%) and West Midlands (19%), which accords with our expectations about where subcontracting is most prevalent. The most frequently cited principal products manufactured, or services supplied, by the subcontractors were: machining, turning and milling, precision metal components, precision engineers, welding, and sheet-metal work. The overlap in such descriptions prevented any sensible disaggregation by product type. Only 3 respondents described their principal production technology as assembly line or continuous process, with batchwork (56%), flexible process (23%) or a combination of these (18%) being the predominant technologies. As a final piece of background, 60% of subcontractors were located within 25 miles of their most important customer, thus facilitating relatively easy personal contact whenever required (see Table I). Only a fifth required a round trip in excess of 200 miles.

TABLE I
Distance between subcontractor and leading customer

Miles	Proportion of Subcontractors
1- 9	38%
10-24	22%
25-49	10%
50-99	10%
100+	20%

III. Size, growth and competitiveness

We wanted to understand the importance of size, so chose a sampling frame of 450 firms employing 1-19 people, 300 employing 20-49, and 250 employing 50-99. As it happens, we obtained a slightly better response rate from the smaller firms. Table II reports the *employment* size distribution of firms, together with their sizes five years previous.³ The median size was 19 employees (mean = 26.1). Four of the sample were new entrants. Discounting these, there was still a

slight growth across the size distribution, particularly in the middle size groups. Quantitatively, and allowing for the fact that the late 1980's experienced general economic growth, there seems to have been modest employment creation amongst subcontractors; the median increase being 3 employees (mean = 4.4). Of course, our sampling procedure fails to pick up firms which had either exited in the last five years or grown to employ more than 100, so great caution should be exercised in drawing conclusions from these employment transitions.⁴

TABLE II
Size of subcontractors

Size	Now	5 years ago
0	0	4%
1- 4 employees	12%	12%
5- 9 "	12%	19%
10-19 "	26%	22%
20-49 "	34%	28%
50-99 "	14%	14%
100+	1%	0

Note: In this and the following tables, totals may not add to 100 due to rounding.

Firms were also asked about their *output* growth in real terms. 72% had grown in the last five years, 16% stayed roughly constant and only 12% declined. Over a half of the output changes were greater than 30%, and 15% exceeded 100%. Looked at alongside the employment statistics, a significant proportion of the sample had made substantial productivity gains.

These background statistics portray a fairly healthy picture among small subcontractors, but what are the sources of competitive advantage they enjoy? Before tackling any specific questions on subcontracting, respondents were asked to rate the importance of five factors to the success of their principal product range (and were given the opportunity to write in others). Rating was on a scale of 1 to 5 where 5 is very important and 1 is not at all important. As can be seen from Table III, reliability of both the product and its delivery are far and away the most important.⁵ Low cost came third, but well behind reliability. A third of respondents took the trouble to write in other

factors, one of the most highly rated being "quality" (without defining the relevant dimensions of quality). More interestingly, an equal number mentioned "a good working relationship", a factor which will find its context in section IV. Overall, the substantial majority of subcontractors see their general competitive advantage as being to provide a quality service, rather than a cheap alternative.

TABLE III
General class of competitive advantage

	5	4	3	2	1	Mean
Product reliability	72	7	10	2	9	4.31
Speed and reliability of delivery	65	18	7	4	7	4.33
Low cost	28	18	39	11	5	3.56
Advanced technology	17	27	20	15	21	3.04
Design for niche market	15	13	21	9	41	2.49
Other (28 responses, with 10 rated '5': see text)						

Notes: '5' is most important. Figures relate to percentage of respondents. Roughly 80 replied to each part of this question.

Towards the end of the questionnaire, we returned to the theme of competitiveness by offering a series of statements relating to possible advantages subcontractors might hold *over their customers*, and asking if they were true or false. These statements are more specific than those reported in Table III, and represent an attempt to understand, for instance, the reasons behind "reliability". Respondents were also asked to separately identify the most important source of their advantage over customer in-house production. The true/false results are given in Table IV and the most important advantage figures are summarised in the text.⁶

Nearly every subcontractor believed that flexibility was an advantage, and 22% rated it as the most important advantage over integrated production. 68 respondents mentioned the source of their flexibility, which was nearly always labour rather than machinery based. The most number of mentions were for: adaptable labour (24), less bureaucracy (14), and no unions (12). However, it was *expertise and technology* that received the largest number of mentions (40%) as the most important source of advantage. The two-thirds

TABLE IV
Specific sources of subcontracting advantage over most important customer

	True	No answer
More flexible in production than your customer, so can better meet fluctuating requirements	90%	3
Superior technology to that available to customer	60%	1
Access to unusually good inputs (e.g. technical contacts, skilled labour)	64%	7
Supply a range of related products so can produce more cheaply	51%	2
Economies of scale and customer's requirements are not enough to exhaust them	51%	7
Cheaper labour than customer	32%	1

acknowledging unusually good inputs mostly mentioned skilled labour as the source. Economies of scale or scope⁷ mattered to a half of respondents, but only a third said they had access to cheaper labour and none claimed this last to be the most important. Those who did mention cheap labour were equally divided across three sources: no unions, lower overheads, and geographically low pay areas. Only one mentioned cheap part-time labour. As with all self-evaluation exercises, we must be concerned that there may be biases due to some sources of advantage (e.g. expertise and technology) being seen as more attractive than others (e.g. low labour costs), and so the former may be over-emphasised.⁸ Unfortunately, it is impossible to assess the importance of such factors. However, if firms do tend to emphasise "good things", that would only serve to strengthen the concerns raised in the next section.

Overall, and bearing in mind the qualifications, the responses build a picture of subcontractors being successful most often by maintaining a technological edge founded on experience at production. More static cost advantages such as economies of scale and scope, or to a lesser extent cheaper labour, are important for about half of subcontractors. However, these are not sufficient conditions for success. Manpower flexibility, and reliability of both the product and its delivery, are

essential qualities if customers are to be persuaded not to look elsewhere or produce in-house.

IV. Dependence and vulnerability

A key issue in subcontracting is the dependence of small firms on a few large customers. The importance of such dependence, or what we term *subcontractor vulnerability*, is a function not only of (i) the share of output taken by dominant customers, but also of (ii) the extent to which output is specialised to particular customers, (iii) the specificity of associated investment made by subcontractors, and (iv) the probability that customers will withdraw their custom. If these are high, then subcontractors are vulnerable in the sense that their businesses would incur substantial losses if an important customer were to, say, switch suppliers. We approached this issue by asking firms about their single most important customer, hereafter referred to as their MIC.

TABLE V
Size of single most important customer

MIC employees	Proportion of MICs	Mean size of subcontractor
1— 19	9%	22 employees
20— 99	14%	9 "
100— 199	10%	16 "
200— 499	22%	24 "
500— 999	11%	33 "
1000—9999	25%	32 "
10,000+	9%	48 "

In order to provide some context, the size distribution of MICs is given in Table V. This question had a relatively low response rate (85%), presumably because subcontractors are often unsure of the numbers employed by their customers. Although over three-quarters of MICs employ at least 100, there remains a significant number of small firms which are subcontracting to other small firms. In our sample, exactly a third of MICs employed 1—199, a third were size 200—999, and a third employed at least 1000. More interesting is the significant positive correlation between MIC size and subcontractor size ($r = 0.366$), with mean subcontractor employment

rising from 15 to 27 and 36 through the three broad MIC size classes just mentioned.⁹

TABLE VI
Dependence on MIC

Output sold to MIC %	Subcontractors %	Subcontractors 5 years ago %
1-10	8	12
11-20	24	21
21-30	26	23
31-40	17	8
41-50	13	11
51-60	6	8
61-70	3	7
71-80	2	2
81-90	1	8

The first source of vulnerability we examine is the share of output sold to the MIC. Table VI shows the distribution of subcontractors by the share of output sold to their MIC (now and 5 years ago). The median dependence is 30%, and this has not changed in the last five years. However, there has been a considerable reduction in the dependence of those who were previously very highly committed to a single customer. The top quartile dependence has fallen from 50% to 40%, with a massive drop in the top decile from 80% to 50%. Thus, *most subcontractors are now concentrating 20-40% of their output on their MIC*. Our interviews with customers confirm the interpretation that they want their demand to be important to their subcontractors, so there are strong incentives to provide a good service, but they are also discomforted by excessive dependence, because they would feel constrained by a moral obligation to maintain orders. From the subcontractor's point of view, the balance is between the desire for a broad customer base to smooth out fluctuations in orders, and the administrative costs of servicing a large number of small orders. It appears that the customers' ideal of absorbing between a quarter and a third of a subcontractor's output both implies a greater dependence than the subcontractor's ideal, and is dictating the current trend.¹⁰

The relationship between subcontractor size and dependence is not straightforward. There is

no simple correlation between the MIC share and subcontractor employment ($r = -0.088$), but there is a slight positive association between MIC share and MIC employment ($r = 0.172$, which is significant at the 7% level). Thus, bigger customers place bigger orders, and these are reflected in both larger subcontractors (see Table V) and their greater dependence.

TABLE VII
Specialisation of output

Share of output which is specific	All customers	MIC
1-33%	7%	7%
34-67%	10%	3%
68-99%	16%	10%
100%	67%	80%

The second dimension of vulnerability is output specificity. Table VII summarises the distribution of output that is specialised to the needs of individual customers. For 90% of subcontractors, over two-thirds of output sold to MICs is specific. Bearing in mind that the "all customers" figure includes the MIC, this specificity is much greater than for secondary customers. There is no correlation between output specialisation and either subcontractor or MIC size. Respondents were asked whether the "all customer" specialisation of output figure had changed in the last five years. 71% said there was no change, only 3 said specificity had declined in the last five years, and *a quarter had experienced an increase in the specialisation of output, which is now very high*. Thus, whereas MIC dependence has declined (at least for those who were previously most dependent), the apparent reduction in vulnerability may have been offset by an increase in specificity.

This high and increasing specificity of output would matter little if the associated production technology was non-specific; i.e. if it did not involve investments in knowledge and machinery which would be less valuable if applied to other customers. We asked firms: "If you were guaranteed a very long term contract, would the ideal production technology involve significant investment in specialised capital equipment that you would have difficulty in efficiently using if the

order was cancelled?" and if the answer was yes, "Are you *currently using* (or planning to use) this ideal technology?". *Exactly one half said that an ideal, specific technology exists, of whom only 40% said they were using it. The problem was particularly acute for the smallest firms:* only a quarter of those employing fewer than 10 had invested in the specific technology if it existed, compared with a half of the larger firms.¹¹ Thus, subcontractors realise their vulnerability and often adopt less appropriate, but more versatile, technologies as a defence. This is precisely as is predicted by transaction cost theory (Williamson, 1985).

Two-thirds of the sample used "a relatively expensive, but *flexible* piece of capital equipment [the MIC] does not possess (e.g. CNC machine tool)". Once again, this is related to size, with only 45% of those employing fewer than 10 having such equipment, compared with 72% of the larger subcontractors. The choice of employment size 10 is not arbitrary. There is no pattern related to sizes of at least 10, either for non-investment in specialist equipment or for expensive, flexible equipment. Taken together, these findings suggest there may be significant capital constraints facing the smallest firms. Only 5% of the smallest firms (i.e. only one of the 22 employing < 10) invested in an ideal technology *and* had expensive flexible capital equipment, while 50% did neither; compared with 24% and 25% respectively for the 68 larger firms.

Physical capital is not the only investment required to service important customers. We asked: "Have you committed significant time and effort in understanding the *specific requirements* of your [MIC]?" and an overwhelming 93% had.¹² Nevertheless, 37% still felt they had not done enough: 26% said that a doubling of their efforts would improve quality or cost by up to 10% and the other 11% claimed even greater improvements were possible. Thus, the evidence for under-investment in customer specific human capital is more limited than it is for physical capital. Furthermore, *there is no clear evidence that investment in time or effort is related to subcontractor size.*

We have built a picture of substantial, though declining, MIC dependence. Subcontractors supply specific products supported by specific investments in physical and human capital, though these

are frequently restricted due to uncertainty over demand and continuity. But just how uncertain is the relationship between a subcontractor and his MIC?

TABLE VIII
Length of subcontractor-MIC relationship

Years	Firms	SC average emp	MIC average emp
1- 2	7%	26	1810
3- 4	13%	17	699
5- 9	24%	23	1691
10-19	38%	28	1507
20+	18%	32	3400

To try to gauge this fourth dimension of vulnerability, we asked two questions directly about the MIC. First: "Has the identity of your [MIC] changed in the last five years (other than by merger or takeover)?" 46% said it had, but how should we interpret this? It could be that the previous MIC had merely dropped to second most important, but it might be that trade had been completely severed, either amicably or acrimoniously. Our second question asked how long the subcontractor had been supplying her *current* MIC. Table VIII presents the somewhat surprising result that 80% had been supplying for at least five years (bear in mind that this was not possible for the four entrants in the sample). Over half had been trading for at least 10 years, with the longest being 44 years. *This suggests a picture of very long term relationships, which nevertheless rise and fall in terms of their relative importance.* As might be expected as firms grow together, there is a significant positive correlation between length of relationship and size of both subcontractor ($r = 0.216$) and MIC ($r = 0.236$).

V. Advantages and problems of subcontracting

All the responses described so far were answers to precisely defined yes/no or true/false type questions. At the end of the questionnaire, we asked a series of open-ended questions about their experience of the advantages and disadvantages of subcontracting.¹³ The over-riding impression of the advantages is that the firms enjoy specialising in a

technology they are good at, and applying it to a variety of interesting work for a range of customers (see Table IX). An illustrative comment is: "providing the customer base is wide enough, the workload is usually stable because the customers cover a wide variety of industries". The alternative to subcontracting they appear to have in mind is revealed in some of the 'negative' advantages, such as no need to market a final product. *Subcontractors are technologists, not marketers.*

TABLE IX
Perceived advantages of being a subcontractor

	Number of mentions
Bigger market, more customers, spread of risk	24
Variety of work	22
No marketing or stock holding or responsibility for the final product	11
Can specialise in own field	9
Lower overheads; little long-term outlay	9
Subcontracting provides a regular core of work	5
Can use equipment more intensively	3
Profitable	2
Ideal way to start new business	2

Note: Firms were not limited to a single observation.

Despite the comments praising the stability provided by a range of customers, irregular and uncertain demand are seen to be much the greatest disadvantage of subcontracting (see Table X). *A preoccupation with uncertainty is revealed by the very substantial overlap between those who see subcontracting as a way of stabilising demand and those who fear irregularity.*¹⁴ The consequences are summed up in one desperate comment: "making decisions with regard to capital purchases and plant investment is almost suicidal!". As expected, these anxieties were associated with vulnerability and dependence: 64% of those selling over half of their output to their MIC complained of irregular demand, compared with only 40% selling less than half. Another correlation between advantages and disadvantages is that those who enjoy the absence of marketing problems are also more likely to complain about cut-throat competition.¹⁵ Loss of control or pressure of work were mentioned by about a quarter of firms. A small number also

complained of poor communications and slow payment. The latter problem is well known, and we had expected more to mention this, but perhaps they had no great hope that other sorts of customer would be any better.

TABLE X
Perceived disadvantages of being a subcontractor

	Number of mentions
Irregular demand	39
Cut throat price competition, low profits	13
Pressure of work, meeting delivery dates	12
Uncertainty of orders makes capital invest. or long-term planning difficult or risky	11
Fear of losing job or customer going bust	11
Loss of control	11
Payment/cash flow problems	9
Poor customer communication — they don't know what they want	6
Time involved in quoting and contracting	2

The size of customer mattered to 23% of subcontractors, but *they were equally divided as to whether large or small customer size was better.* Half of those who gave a reason favoured larger firms, observing that they: were more professional, gave more demanding (and so interesting) work, and, significantly in the light of the previous section, provided a justification for making investments. Those preferring to work for smaller firms complained that larger ones are: bureaucratic, bossy, or inflexible. A typical remark was: "we can do the work whilst they are still doing the paperwork". Clearly, our sample of firms had a range of experiences!

Finally, Table XI summarises suggestions for improving the subcontracting relationship. 68 firms expressed an opinion, some of them making more than one suggestion. A strong first place goes to the *need to improve information and communications*, for example: "a recognition that even subcontractors need to invest in new technology to give a better service — a point rarely recognised when discussing price increases". This emphasis on information and communications as a suggested improvement contrasts with a relatively low incidence of mentions as a problem. The

TABLE XI
Suggestions for the improvement of the subcontracting relationship

Better two way information; regular meetings	35
Longer contracts, stable customers and prices	24
More trust on the part of the customer	10
Quicker payment	9
Better presentation of requirements and technical drawings	7
Stable economic climate	3
Investment by the customer	1
Consistent and better quality of customer's materials to be worked on	1

explanation appears to be that even though communication may not be the greatest problem, it is seen as one that has a feasible, straightforward and relatively cheap solution. Stability and longer contracts came an important second, once again emphasising the twin problems of uncertainty and vulnerability. Interestingly, greater trust beat quicker payment into third place. They complained that subcontracting was an unnecessarily adversarial relationship, which could be improved by building a spirit of teamwork. These feelings undoubtedly feed off lack of both information and face-to-face contact (despite the geographical proximity revealed in Table I).¹⁶

VI. Conclusions

Successful subcontractors are able to share in the success of their customers. What small subcontractors have to offer is predominantly experience with a particular technology; and that technology is one which most subcontractors enjoy applying to a range of customer demands. Labour flexibility and economies of scale and scope are also important sources of competitive advantage, but cheap labour seems to be of only minor relevance.

Typically, a third of output is sold to the single most important customer, and all of that output is produced to a specific design. This dependence might not matter if subcontractor and customer worked together in a long-term, trusting partnership. Unfortunately, despite being long-term, there is evidently too little trust and communication for a fully efficient relationship. The result is considerable concern over demand fluctuations and cus-

tomers continuity, and the avoidance of investment in ideal, specific technologies. The problem is particularly severe for the smallest firms, employing fewer than 10, who are also less likely to possess expensive, flexible capital equipment. Increased use of formal contracts may provide some improvement, but contracts cannot legislate for trust. Genuine, lasting improvements in the subcontracting relation must probably be built on the development of a more cooperative *inter-corporate culture*.¹⁷

Finally, our finding that there are quantitative differences in behaviour around an employment size of 10 suggest that this might be an important dividing line in the *definition of very small firms*. In a multiple probit regression analysis, one of the authors has found that size is also an important determinant of whether subcontractors hold formal contracts (see Lyons, 1991). Those employing 10 or fewer have a less than 1% probability of holding a formal contract, but this rises to a 46% probability for those employing 100. The causes and consequences of this lack of formal contracts deserve further investigation.

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Notes

¹ Unfortunately, we were restricted in our access to the Findlay address list and were unable to follow up non-respondents.

² The interviews concentrated on qualitative, rather than quantitative, answers.

³ One firm employing 110 people had grown from only 67 employees in 1986. We decided that, despite contravening our size criteria, such success should not exclude a firm from our analysis.

⁴ Nevertheless, it is interesting to note that 60% grew in employment terms and only 23% declined; which compares

with the 50% who grew and 33% who declined for the 12 firms who returned their questionnaire despite making only standard products. We can tentatively conclude that subcontractors were doing at least as well as other firms.

⁵ The order in which the five factors were suggested in the questionnaire was: low cost, design for niche, speed and reliability of delivery, advanced technology, product reliability, other.

⁶ Note also that whereas Table III includes advantages relative to other potential subcontractors, Table IV is much more focussed on the reasons for the customer not self-supplying.

⁷ Economies of scale relate to average cost reductions as the output of a particular product increases; while economies of scope relate to average cost reductions as the number of products increases (holding constant the production of each particular product).

⁸ Similar factors may bias the response rate.

⁹ Unfortunately, the interviews could not shed any light on this correlation. It might be because very small firms find it more difficult to find work with larger customers. Alternatively, given the long-term relationships we report below, it could be that customers and suppliers grow or stagnate together.

¹⁰ One, not untypical, subcontracting interviewee (with 106 employees) sold 24% of his output to his most important customer, 70% to the largest 5, and 80% to the top 10. He had 100 customers in all, but would ideally have had just 10, each demanding 10% of his production.

¹¹ There is also some less consistent evidence that subcontractors are less likely to invest if their MIC employs fewer than 100.

¹² The remaining 7% all supplied MICs of size less than 500 employees.

¹³ Unfortunately, these questions were not as well phrased as they should have been. In particular, we did not specify the alternative to subcontracting, against which the advantages and disadvantages should be judged.

¹⁴ Recall that this survey was conducted in early 1991, which was a period of substantial recession in the UK.

¹⁵ E.g. "lack of negotiating 'clout' makes price increases very difficult to obtain at a sensible level — a lot of competition in our field".

¹⁶ Once again, our interviews supported this interpretation.

¹⁷ This might involve efforts to bring about a harmony of objectives, formal and informal mechanisms for regular information sharing on demand and technology, and possibly joint planning. Ideally, the exchange of information should be as free and undistorted as in an integrated organization, while still preserving the powerful incentives that derive from independent operation.

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