

Case studies of public subsidies

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A report prepared for the Office of Fair Trading
by NERA Economic Consulting

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1 INTRODUCTION AND SUMMARY

- 1.1 The OFT commissioned NERA Economic Consulting (NERA) to undertake research and analysis of the impact of state subsidies on competition in markets. NERA analysed six case studies to assess whether subsidies have impacted on competition in practice.¹ The present paper is a summary of the results obtained from the six case studies.²
- 1.2 This work focused on the effects of subsidies on competition and did not investigate the overall benefits or effectiveness of the subsidies considered. The assessment of competition effects is only one element of a full assessment of a subsidy. Therefore conclusions reached in this report relate only to competition effects and should not be interpreted as evaluating all aspects of a subsidy.

Purpose of the case studies

- 1.3 The case studies were part of a wider project aimed at analysing the effects of public subsidies on competition. In 2004 the OFT undertook a first stage of work that developed a framework for identifying whether a subsidy was likely to have a significant effect on competition.³ This framework identified a number of Subsidy and Market Characteristics (SMCs) associated with competition distortions.
- 1.4 The objective of the case studies was to:
- identify situations in which subsidies have and have not had a significant effect on competition
 - consider the characteristics of the subsidies associated with effects on competition, and

¹ In this report 'we' refers to NERA. We have drawn on work by the OFT in a number of places and have referenced it accordingly.

² The names of the firms and industries involved are kept confidential.

³ Public Subsidies, OFT 750, November 2004.

- aid the development of practical recommendations for assessing the likely effects of subsidies on competition.

Approach and conclusions

- 1.5 For each case study we examined the characteristics of the subsidy and of the market it affected. We tested whether an effect on competition was likely, based on the theoretical framework that was designed in an earlier stage of work undertaken by the OFT.
- 1.6 We then considered the actual changes in the market following the provision of each subsidy, including:
 - the displacement of competitors
 - increase in market power, and
 - the deterrence of entry to the market.
- 1.7 In most of the six case studies, and in particular the grants to firms A, B and D, the subsidy characteristics strongly suggested that the subsidies could have materially distorted competition. Whether they would in fact have done so, however depends on the market characteristics. Accordingly, this creates a case for undertaking market assessments of public subsidies.
- 1.8 In two of the six cases – both involving regional grants – the market characteristics suggest that the competitive process is likely to have been affected by the subsidy, in one case through a direct impact on market output (firm D), and, in the other, more probably through influencing which capacity remained in the market and which capacity exited (firm A). In one of these two cases (firm D) there is some evidence to support the hypothesis of competition distortion.

- 1.9 In the case of firm B, the market characteristics indicated that its grant was unlikely to distort competition significantly. This is because firm B was a small player in a market otherwise characterised by a small number of players with large market shares. Opinions gathered from competitors support the view that distortions to competition did not arise.
- 1.10 In two of the cases, the subsidies affected markets with very limited activity by commercial businesses. The subsidy was made available, in both cases, through open competition and our research found no evidence of significant distortions to competition. Furthermore, the design of the subsidy in both cases was unlikely to prevent the development of competition in the future if the activity became commercially viable.
- 1.11 In the final case we found that although the size of the grant was significant and it was given selectively, the recipient operated in a highly fragmented industry and therefore did not alter the recipient's relationship with its competitors.

2 METHODOLOGY

Results from theoretical research

2.1 The OFT's first market study on public subsidies⁴ identified the following ways in which subsidies might distort competition:

- causing firms to set output and pricing levels inefficiently
- keeping inefficient firms in the market, discouraging entry by efficient companies, or encouraging entry by inefficient firms, and
- distorting investment and research and development decisions.

2.2 Following theoretical analysis undertaken for the OFT by Frontier Economics, the preliminary conclusion was that the degree of competitive distortion would be affected by the following subsidy and market characteristics (SMCs):

Table 2.1: Subsidy and market characteristics

Subsidy characteristics	Market characteristics
The absolute size of the subsidy as well as its size relative to the costs of the activity being subsidised.	Market concentration.
The level of selectivity of the subsidy, that is, whether it is provided to one, some or all firms in a market.	A high level of product differentiation.
Whether the subsidy affects the recipient's costs directly.	Whether the firms in the market are of markedly different sizes.
Whether the subsidy is provided on a recurring basis.	Barriers to entry.
	Firms in the market compete on research and development.

⁴ *Public Subsidies, A report by the Office of Fair Trading, OFT750, November 2004.*

Analytical structure

2.3 The empirical research in this second stage of work aimed to:

- identify situations in which subsidies have and have not had a significant effect on competition
- consider the characteristics of the subsidies associated with these effects on competition, and
- assist with the development of practical recommendations for assessing the likely effects of subsidies on competition.

2.4 To address these factors we adopted a two-level analytical approach:

- first, we examined the characteristics of the subsidy and the market that it affected to assess the likelihood of distortion to competition. For example, we assessed whether the subsidy was large in relation to the recipient's costs, or whether the recipient had a significant share of the market, and
- second, we analysed whether a material competitive distortion had, in fact, arisen.

2.5 We also looked for aspects of subsidy design and specification that were effective in reducing the risk of significant distortions to competition, even if they were not necessarily prominent in the SMCs.

2.6 Identifying direct links between the subsidy and market performance is extremely difficult in most cases. We have made use of all the data available to us to draw direct and indirect links.

Scope of analysis

2.7 In undertaking these case studies we have considered the effects of the subsidies on competition in practice. We have not revisited the theoretical analysis of stage one of the public subsidies work.

2.8 We have taken it as a working assumption that the subsidies were provided for the purposes stated by the subsidy providers and that the decision was soundly based. Our focus has been on whether the subsidies had unintended consequences for competition. In some cases a subsidy scheme might have as its objective an impact that the OFT research paper identified as a potential distortion. In these cases we have assumed that the subsidy was a well founded attempt to address a market failure.

Sources of evidence

2.9 We have used the following forms of evidence for the case studies:

- **research using public sources.** We carried out background market research using a wide range of publicly available sources, for example, market reports, news searches, company research and accounts, competition cases, analysis and decisions published by regulators and so on. We have also reviewed publicly available material on the subsidy schemes concerned
- **data and information provided by the subsidy providers.** We interviewed the subsidy providers and reviewed relevant documentation (subsidy applications, appraisal papers, offer letters, contracts, and so on) that the providers made available to us
- **information from the subsidy recipient and its competitors.** While we were successful in obtaining a reasonable degree of cooperation, some companies did not wish to engage with us.

2.10 The evidence we have gathered has been useful for understanding many key aspects of the subsidies, the markets affected, and the impact on competition. However, NERA notes that much of the evidence is anecdotal or is purely descriptive. Thorough empirical analysis of the reaction of market prices, sales volumes and entry and exit behaviour to the subsidies would have been desirable, however the data requirements for such analysis are quite onerous and comprehensive datasets were not available to us.

3 THE SIX CASES

3.1 Our six case studies are not intended to be statistically representative of the subsidies given in the UK. We chose a selection that feature a variety of the subsidy characteristics that were identified in the framework in the OFT's first stage of work.

3.2 The case studies were the following:

- a grant to firm A to support acquisition of a non-operational manufacturing plant and its set-up for production to promote employment and investment in a deprived area of the UK
- a series of Research and Development (R&D) grants to firm B, a technology start-up. The subsidy aimed to promote innovation in a region of the UK
- support to firm C, via a procurement process, to roll out network infrastructure in a rural area
- a grant to firm D to support relocation, modernisation and capacity expansion of its manufacturing and distribution facilities. The subsidy aimed to prevent the company shifting its manufacturing activities to the Far East, thus safeguarding existing jobs and creating additional jobs in the region
- Regional Venture Capital Funds (RVCFs) subsidy E: a scheme to promote the provision of equity capital to small and medium-sized enterprises (SMEs). The government acted as a subordinated co-investor alongside private capitalists in venture capital funds run by professional fund managers, and
- subsidies provided by several public bodies to set up and maintain museum F.

Summary of subsidy and market characteristics across all six case studies

3.3 The table overleaf summarises the degree to which each of the SMCs individually applies.

Table 3.2: Summary of subsidy and market characteristics

	Firm A	Firm B	Firm C
Subsidy characteristics			
Selectivity	Selective. Firm A was the only firm in the market to obtain funds. Application open to any firm active in the region in question, but only one plant available for de-mothballing.	Selective. Firm B was the only firm in the market to obtain funds. Application open to any firm with an established business in the region	<i>De facto</i> selective. Tender for a procurement contract and all competitors could bid. However, tender encompassed services already provided by two bidders who are likely to have had particular advantage. Tender design created 'competition for the market'.
Costs affected	Fixed costs of opening a plant	R&D-specific subsidy	Fixed costs of network extension
Magnitude	Moderate (5-10% of fixed setup costs). Purpose was to de-mothball plant and create employment in the UK, so intention was that subsidy should be material to decision	Substantial (30-40% of R&D spend since foundation of the firm). Start-up firm so <i>intention</i> was in effect that subsidy should be material to entry of this company	Substantial (~ 75% of total cost of the infrastructure to be created). <i>Intention</i> of subsidy was to roll out infrastructure where it was commercially non-viable.
Time structure	Payments in instalments over five years. Obligation to return payments if operation ceases, creating incentive to remain in market over time	Individual projects are temporally limited, but the firm has received four separate grants since 1998	Temporally limited, payments in instalments over three years but do not directly affect ongoing operating costs

Market characteristics

Concentration	Sales: moderately concentrated (large number of players, market share of largest firm: ~ 15 %) Capacity: concentrated, although firm A has largest capacity	Highly concentrated	Highly concentrated (small number of network operators in any local market)
Symmetry	Sales: largest share ~ 14%, with gradual 'tail' (firm A < 5%) Capacity: firm A appears to be clear leader	One large firm, four medium-sized firms, and a small fringe. Firm B's market share: < 1 %.	Regional leader with monopoly position in some areas won the contract
Product differentiation	Moderate	High	Low
Barriers to entry	Significant: large fixed set up costs, although availability of moth-balled plants may point to lower costs	Significant: R&D-intensive industry	Significant: network industry, even monopoly commercially non-viable without subsidy in some local areas
Importance of R&D	Material in setting up a plant, less important for competition between products	Important: new products are constantly brought to market. Key dimension of competition along with marketing	Not important in the short run

	Firm D	Regional Venture Capital Funds subsidy E	Museum F
Subsidy characteristics			
Selectivity	Selective. Firm D was the only firm in the market to obtain funds, however, application is open to any firm active in a qualifying region.	Selective to a moderate degree. Any registered fund manager could propose setting up a RVCF, but only nine – one in each English region – were supported.	Selective. Subsidised leisure and tourist attractions may compete with purely commercial offerings that do not receive support.
Costs affected	Fixed costs of relocating, expanding and modernising production and distribution centre, distribution costs, possibly variable costs	Cost of capital of the fund	Fixed costs of establishing the museum, ongoing costs subsidised under the condition that no entry fee is charged.
Magnitude	Substantial: more than 30% of the project investment, 5% reduction in (variable) costs of direct materials when compared to the counterfactual (move production to the Far East)	Cannot be determined exactly based on the information we have seen. Government contribution to fund substantial (30% of a RVCF on average), but no information on level of subordination of government investment. <i>Intention</i> of the subsidy was the creation of RVCFs	Substantial. The museum could not have survived without massive support from public money.
Time structure	Payments in instalments over several years. Obligation to return payments if operation ceases creates	Funds have an (extendible) life cycle of ten years	Revenue support provided on an ongoing basis.

incentive to remain in market over time.

Market characteristics

Concentration	Highly concentrated: only five players identified, of which at most three are substantial.	UK market for equity capital is highly fragmented, but RVCFs supply in niche market with a relatively small number of players	Moderately concentrated.
Symmetry	Firm D is the clear market leader with a market share in excess of 50%.	RVCFs very small compared to the largest venture capital funds, but probably very large in their niche markets.	Museum in question is a mid-sized player in any plausible candidate relevant market.
Product differentiation	Moderate	Moderate	High
Barriers to entry	At least moderate: fixed costs of entry, reputation barriers to entry.	Investment size is subject to large economies of scale, so that investing in small companies is not attractive (not a barrier to entry strictly speaking).	Unclear
Importance of R&D	Not important	Not important	Not important

Grant to firm A

- 3.4 Firm A received a grant to support the acquisition and conversion of a non-operational manufacturing plant. The grant was payable in several instalments over five years. Under the conditions of the offer letter, the aid provider was entitled to repayment of part or all of the grant if the employment and investment targets were not met —for example if the

plant ceased to operate. The objective of the grant was to provide an incentive for firm A to opt for large-scale production in the UK, rather than making a small expansion of an existing plant in another country.

- 3.5 At the inception of this grant, the industry was growing rapidly and expectations were that this trend would continue. However, the industry instead suffered a severe contraction that left it with high levels of excess capacity. Since 2003 the industry has been consolidating, with various episodes of competitors merging or leaving the market.

Inferences from the SMCs

- 3.6 First, we considered whether the grant was likely to have had a significant impact on competition, based on the framework developed in stage one of the OFT's research project. At first sight, several of the SMCs suggest that this subsidy could have had a material effect on competition in the relevant market. The subsidy characteristics suggest that there is clear scope for the subsidy to impact on competition, either through an impact on prices and output or through the entry and exit decisions of firm A.
- 3.7 The subsidy was selective in that only one firm in the market benefited from it, and there was only one mothballed plant in the locality, although any firm could have applied for the subsidy with a similar project.
- 3.8 The subsidy was intended to result in firm A de-mothballing the plant. Accordingly, if the subsidy was well directed and achieved its purpose, the effect was to bring this additional capacity into the marketplace and to keep it in the marketplace.
- 3.9 The subsidy required repayment if firm A left the market and so gave the firm incentives to remain, hence creating a barrier to exit the market.

3.10 There are market characteristics that suggest that the subsidy to firm A might have distorted competition:

- the low level of product differentiation in the market suggests that a major capacity expansion might well have an impact on other players in the market. Significant costs of entry also suggest that any competition distortions might persist, and
- firm A's share of capacity appears to be the one of the highest in the market,⁵ and this is largely due to its control of the subsidised plant.

3.11 Accordingly the subsidy may have maintained a substantial amount of capacity in the market that otherwise might have exited. We would expect this to affect prices and output in the market, or to affect entry and exit decisions of other players.

3.12 There are other characteristics of the market that suggest that the impact may not have been as large as initially suspected:

- sales in the market were fragmented at the time the subsidy was offered and not greatly asymmetric, and this has not changed substantially. The Herfindahl-Hirschman Index (HHI) of shares of sales in 2004 was smaller than 700, indicating that the levels of concentration in the market were low. Firm A's own share is less than five per cent. This relatively small share of actual output suggests that firm A's direct impact as an effective competitor in the market has been weaker than its share of capacity might suggest

⁵ Firm A has stated that its annual production capacity is now much lower than reported in company publications shortly after the plant was opened. However, it has also confirmed that with some minor investments in additional equipment and expanding its staff, the capacity initially reported could be established at relatively low cost and within in a short time. For the purposes of this analysis it therefore seems appropriate to use the larger capacity number.

- excess capacity is endemic in this industry and it may be that firm A's contribution to the excess capacity, though large, has not added materially to the general impact of the overhang on market prices. However, it seems quite possible that firm A's continued presence in the market with a large capacity plant may have displaced other firms that might otherwise have decided that it was worthwhile remaining in the market in anticipation of the benefits of industry-wide rationalisation or an eventual upturn.

3.13 Taken together we consider that there is a case that a material impact on competition could have occurred in this market. It may have involved a direct impact on prices and outputs, although it is more likely to have influenced the process of exit of capacity in industry rationalisation.

Theory and evidence of actual distortions

3.14 There are several effects that may have occurred as a result of the subsidy to firm A:

- **generation of increased market power:** The subsidy could have caused firms to leave the market, increasing market concentration and enhancing market power. However, this is unlikely to have been the case. The market was fragmented at the time firm A entered the market. It also appears that due to a low level of product differentiation, price competition was intense. This situation has not changed substantially since firm A's entry, and the market structure remains competitive
- **displacement of more efficient suppliers:** Firm A's entry could have caused more efficient competitors to exit the market. Cost inefficiencies might have arisen as a consequence. Based on the information available, this theory can neither be proved nor disproved. As part of probably inevitable industry consolidation, a number of competitors have exited since firm A has entered, and we cannot rule out the possibility that some competitors might not have exited if it had not been for the presence of firm A. There is, however, no readily available information about whether these firms were more or less efficient than firm A

- **discouragement of new entry:** Firm A's presence in the market could have discouraged entry by new competitors, potentially preventing new production methods, products or business models being introduced. However, given the downturn in the business cycle that the industry has suffered since the opening of the UK plant and the persistently large excess capacities, the prospects of significant new entry would have been unlikely even in the absence of firm A.

3.15 We have not been able to gain sufficient evidence to assess whether firm A's continued presence in the market, using the subsidised plant, has resulted in material changes to prices, output or the entry and exit decisions of other firms.

Conclusions: firm A

3.16 Our conclusions in respect of this case study are that:

- the subsidy characteristics are consistent with a material distortion of competition arising from the subsidy, suggesting that a market analysis should be undertaken before subsidies in this scheme are issued
- the market characteristics suggest that the distortion of prices and output in this case are unlikely to have been material, although the possibility that the subsidy impacted on the capacity decisions of other firms cannot be ruled out (and it is even possible that some moderate impact on prices and outputs may have occurred)
- subsidies that aim to 'lock in' employment in a region may also 'lock in' capacity in an industry undergoing a sharp, but unexpected, capacity rationalisation. Future assessments of the competitive impact of a subsidy may need to address the possibility that the future development of the markets are markedly different from what is expected, and
- there is insufficient evidence to test what actual impact the subsidy has had (if any) on prices, outputs or entry and capacity decisions of non-subsidised firms.

R&D grant to firm B

- 3.17 Starting in 1998, firm B received a total of four R&D grants totalling around £1 million. Two of the grants supported the start-up of the company, helping to finance a feasibility study and development of a prototype that was then commercially exploited. The other two grants supported the development of additional products in the same product family.

Inferences from the SMCs

- 3.18 Several of the subsidy characteristics that the stage one framework identified as likely to lead to a distortion of competition are present in this case.
- 3.19 The subsidy was partially selective in that only firms with an established business in the region in question could apply, whereas the relevant market appears to be international.
- 3.20 Since the firm in question was a start-up established to develop and exploit the technology being subsidised, the subsidy was intended to promote market entry. The size of the subsidy was also consistent with a conclusion that this entry would not have occurred without the subsidy. Moreover, investment in R&D is a key dimension of competitive behaviour in the industry affected. Accordingly, a subsidy directed at R&D is more likely to impact on competitive dynamics in this industry than in others.
- 3.21 The firm received four separate grants from the same source over a seven year period, with the potential that any effects of the subsidies were likely to have been ongoing.
- 3.22 However, the market characteristics are not consistent with the subsidy having any material effect in distorting competition:
- the subsidised firm has achieved a market share of less than one per cent in all plausible markets other than the very specific niches that it occupies

- the market is concentrated⁶ and is likely to have some barriers to entry, suggesting that if anything the promotion of an additional entrant to the competitive fringe would be pro-competitive in a static sense
- individual products tend to be differentiated, limiting the likelihood that a material impact on prices and outputs would be expected
- while the subsidy is likely to have led the recipient to engage in R&D, the entire purpose of the subsidy was to promote innovation, so, in keeping with the objectives, we have not considered whether the R&D concerned is likely to have been efficient.

Theory and evidence of actual distortions

3.23 These characteristics indicate that the grants might have provided an effective incentive for firm B to enter the market and to introduce a number of products it would not have produced otherwise.

3.24 The following theories of competitive harm are possible:

- **the generation of increased market power:** The grants might have prompted firm B to enter the market. This might have forced competitors to exit the market, leading to a more concentrated market and an increase in market power
- **the displacement of more efficient suppliers:** The grants might have prompted firm B's market entry. As a result, more efficient suppliers might have been displaced, and
- **the discouragement of entry:** The grants might have deterred entry by new players.

⁶ The largest five firms in the market account for 95 per cent of all sales.

- 3.25 The three possibilities are considered to be unlikely on examination of the evidence. Given firm B's very small size relative to the industry it is operating in, appreciable effects on competition are very unlikely. This is consistent with the fact that there has been no change in market structure since firm B's entry, and that we have not found any evidence of price alterations or competitor complaints.

Conclusions: firm B

- 3.26 Our conclusions in respect of this case study are:
- the subsidy characteristics are consistent with a material distortion of competition arising from the subsidy, suggesting that a market analysis should be undertaken before subsidies in this scheme are issued
 - however, the market characteristics, especially the recipient's small market presence, are not consistent with any material competition distortion.

Network infrastructure services from firm C

- 3.27 The subsidy to firm C aimed to overcome a situation of perceived under-provision of network-based services in a rural area. At the time the subsidy was awarded there was a limited provision of network services in some parts of the area by firm C and a competitor. The subsidy aimed to introduce and upgrade networks for provision of a service that was expected to be commercially non-viable.

Inferences from the SMCs

- 3.28 If the purpose of this subsidy was well founded, then a monopoly was being introduced in a situation where, without the subsidy, even the monopoly would not have existed. In this type of situation, the subsidy is not likely to materially distort competition because without the subsidy there was no competition in the first place and the expectations were that no competition would have emerged.

3.29 Considering the subsidy and market characteristics:

- the subsidy is selective in that only one firm receives it and there are several that could have provided the network. However, the tender was open to any provider in a position to make a competitive offer and several firms submitted bids. This does not rule out the possibility that competition may have been distorted by the subsidy, but reduces the risk of these arising, compared with other selection mechanisms. The tender mechanism might also have ensured that the operator offering the most efficient solution was selected for provision of the service. Further, competition for the subsidy may also have forced the operator to pass on part of the efficiencies and any expected monopoly rents in the form of lower requirements for public funding
- the subsidy covered a large proportion of the costs of establishing the network
- at the national level, the market is concentrated with one clear market leader. However, the area of network created by the subsidy is small relative to the national market. At the local level there are only two players active, with a limited degree of actual geographical overlap
- the market is characterised by very substantial barriers to entry due to economies of scale and network effects.

Theory and evidence of actual distortions

- 3.30 The subsidy to firm C is likely to have been substantial compared to the fixed costs of establishing the network, and it is likely that it was instrumental in prompting the firm to extend its network to the whole of the subsidy area.

3.31 We therefore considered the following hypotheses:

- **the displacement of more efficient suppliers:** The subsidy might have caused firm C to expand its network to provide access to new customers. This could have prevented its only competitor in the area from expanding, or new competitors from entering the market. However, the subsidy was provided because commercial provision was deemed unprofitable and hence the likelihood that firm C's competitor would have expanded to cover the area, or new players would have entered, is low
- **the generation of increased market power:** The subsidy might have given firm C a competitive advantage in those areas where there is some overlap with a competitor. This might have allowed firm C to drive the competitor out of the market and achieve a monopoly position. Although we can't rule out this possibility altogether, it would appear that there has been no significant customer shifting from the competitor to firm C, although this might change once the rollout of firm C's network has been completed. We cannot rule out the possibility that firm C might end up as the only provider in those areas, although we have no reason to believe that this will be the case
- **the discouragement of entry:** The subsidy might have deterred new entrants from competing in the area. However, given the barriers to entry mentioned above it is unlikely in a region as thinly populated as the subsidy area that the market would support more than two providers of the network service in question. It is therefore unlikely that a player other than the two already established in the area – firm C and its competitor – would have been likely to enter.

Conclusions: firm C

3.32 The subsidy is not likely to materially distort competition because, without the subsidy, there was no competition in the first place and the expectations were that no competition would have emerged.

- 3.33 We note that, while the subsidy has some ongoing payments, these last only for three years and they amount to a form of risk-sharing between the subsidy provider and recipient. In our view the direct effect of the subsidy is largely limited to the establishment of the new network facilities, not to their ongoing operation or pricing. This is desirable because if future cost or technology conditions make it commercially viable to offer competitive services in a way that is not currently foreseen, the subsidy will not have an ongoing role in preventing such competition.
- 3.34 However, this generally benign conclusion is dependent on the observation that other forms of service delivery did not exist in most of the area. Although the focus of the subsidy is on areas that firm C did not previously cover, it does encompass areas where it did have existing coverage, and in particular one small area where there was at least some degree of competition between firm C and another firm.

Grant to firm D

- 3.35 This grant was provided to assist firm D relocate and expand production and distribution facilities on a single site in a region of the UK.
- 3.36 At the time, firm D operated from a number of sites in the region. In its application for the grant, firm D explained that this structure was not appropriate for efficient supply to its customers. The firm presented two options to reduce its costs and increase efficiency:
- **the restructuring of its UK operations**, concentrating all its manufacturing and warehousing on one large site with the implementation of improved manufacturing and distribution techniques
 - **shifting production to the Far East**. This involved importing via a subsidiary based in the Far East. The only investment required was construction of a warehouse facility at a suitable location in the UK.

- 3.37 The subsidy was equivalent to the undiscounted difference between the forecasted net profits under both options over five years. The grant offer was subject to various conditions, including an obligation to safeguard all existing jobs and create more than 130 new ones.

Inferences from the SMCs

- 3.38 The SMCs were considered to assess whether the grant was likely to have a significant impact on competition. The subsidy characteristics suggest that the grant is likely to have affected the pricing and output decisions of firm D, as shown below:
- the subsidy was selective in that only one firm in the market seems to have obtained the grant, however, any other competitor active in a qualifying region could have applied for one
 - the subsidy was a substantial amount. It contributed more than 30 per cent of the costs of relocating, modernising and expanding firm D's manufacturing and distribution facilities in the region
 - in the absence of the grant, it was the stated intention of the firm to close down its manufacturing activities in the UK and serve the UK market via imports from the Far East, firm D's own forecasts suggested that in the medium term this was the more profitable option if no government support was provided
 - firm D had received subsidies in the past.
- 3.39 The market characteristics suggest that the subsidy's influence on firm D's strategic decisions might have a substantial impact on the market.
- firm D is the clear market leader with over 50 per cent market share. Therefore its decisions will be clearly felt by all competitors in the market. A subsidy helping the market leader to further expand its sales could be expected to lead to significant displacement of other competitors

- the market is highly concentrated. There appear to be only two substantial players, and around three minor competitors
- together with barriers to entry that are at least moderate, relatively high fixed setup costs and the importance of reputation in this business, the high concentration is consistent with the existence of at least some degree of market power.

3.40 Taken together, the subsidy and market indicators support the view that the grant to firm D might have distorted competition.

Theory and evidence of actual distortions

3.41 Given the characteristics of this market and subsidy, it is plausible that the grant would have caused firm D to expand its capacity and reduce its price. As firm D is already the largest player in a highly concentrated market, several theories of competitive harm are plausible.

The displacement of more efficient suppliers

3.42 The increase in manufacturing and warehousing capacity and streamlining and modernisation of its operations might have enabled firm D to further expand its market share. Other players, that were not less efficient than firm D before the subsidy was paid, might have been displaced.

3.43 Firm D's stated reason for filing an application for the grant was that its operations at the time were inefficient, and that it had come under competitive pressure.

3.44 In absence of the grant, firm D's solution to the problem would have been to move manufacturing to the Far East, in which case it expected modest growth in turnover from 2002, due to the fact that not all customers could be supplied with suitable products, and that it was more difficult to serve short-notice orders. This appears to be the most appropriate counterfactual against which to assess the impact of the subsidy.

- 3.45 Firm D's own projections show that it expected its market position over time when given the subsidy would be substantially stronger than under the counterfactual. In the first two years following restructuring and relocation, turnover was expected to be the same in both cases. However, by 2005 turnover was expected to be more than 20 per cent higher if firm D restructured using a grant, while under the 'Far East' option only stagnant growth was expected. In fact, its actual turnover has grown even more dynamically than predicted in the forecasts it made for the 'UK' option.
- 3.46 This high growth will have displaced business from competitors compared to a situation where firm D relocated in East Asia without the subsidy.

The generation of increased market power

- 3.47 Market power might have increased, and allocational inefficiencies created as a consequence of firm D's subsidised activities. This is because the increase in manufacturing and warehousing capacity and streamlining and modernisation of its operations might have enabled firm D to drive competitors out of the market. Higher market concentration might then have supported higher prices.
- 3.48 The market under consideration appears to have been highly concentrated before payment of the subsidy. Firm D's turnover data, discussed above, suggest that the grant enabled it to further improve its already strong market position. However, at the present time there is no evidence of any competitors having exited the market. Information on prices is confidential and so we have not been able to assess whether this strengthening of firm D's position has affected prices.

Prevention of new entry

- 3.49 Firm D's capacity expansion and possible price reductions might have discouraged new players from entering the market.

- 3.50 The market is characterised by some barriers to entry, and we are not aware of any significant episode of entry in recent years. It is difficult to determine whether the subsidy was instrumental in preventing entry (as even without the subsidy the market conditions might have made entry unattractive). In any case, the grant to firm D, by enabling the market leader to maintain a level of sales higher than would otherwise have been the case, is likely to have made entry even more difficult.

Conclusions: firm D

- 3.51 The subsidy and market characteristics suggest that the grant to firm D might have substantially distorted competition in the industry.
- 3.52 The subsidy was substantial and likely to be effective in making it unattractive for firm D to shift manufacturing from the UK to the Far East. As a result, the market leader in a highly concentrated market is likely to have gained a market position that it would not otherwise have expected.
- 3.53 Consequences of such a situation could be customer benefits in the form of lower prices in the short term, but the elimination of competitors, higher market concentration and higher market power possibly leading to higher prices in the long term.
- 3.54 The evidence supports the view that there has been a shift of market share from competitors to firm D. So far there is no evidence of firms exiting the market, which could lead to a more substantial change in competitive dynamics.

Regional Venture Capital Funds – subsidy E

- 3.55 In 1999, the UK Government launched the Regional Venture Capital Funds (RVCFs) programme as part of its effort to stimulate the availability of finance for small and medium enterprises (SMEs). Between 2002 and 2003 nine such funds – one for each of the English regions – were set up.

- 3.56 The RVCF programme aims to support SMEs. While distortions might arise in the markets where the supported SMEs operate, we have concentrated on potential competition effects in the market for the provision of capital funds.
- 3.57 We assessed the effect of the provision of subordinated government co-investment to privately managed venture capital funds aimed at SMEs on competition in the venture capital market (rather than between SMEs, which are the final target of the subsidy).
- 3.58 RVCFs address firms that need equity capital of up to £500,000. A variety of our sources suggest that purely commercial venture capital funds are usually not interested in providing investments in this size bracket, due to the costs of setting up and monitoring an equity deal which vary less than proportionally with investment size — the equity gap. There is likely to be some overlap at the margin between RVCFs and business angels and angel networks that typically provide equity capital in small amounts.

Inferences from the SMCs

- 3.59 The RVCF scheme is selective in the sense that only nine firms, one in each English region, have been admitted to set up an RVCF. However, any fund manager could have proposed a RVCF, and the government expressly stated that more than one fund per region might be set up if suitable proposals were received.
- 3.60 Due to the subordination of government investment, the RVCFs obtained government funds on preferential terms, allowing them to offer better terms to investors and provide equity capital to businesses on more favourable conditions than they could have done otherwise.
- 3.61 We have not had access to comprehensive information about the degree of government subordination in individual RCVF, and are therefore not in a position to estimate the amount of the subsidy. We note, however that the DTI's participation in the funds has been substantial (almost 30 per cent on average).

- 3.62 However, if there is an equity gap affecting at least the investment size bracket where the RVCFs are designed to operate (which seems likely on the evidence we have seen) this suggests that a subsidy was necessary to attract funds into the small-investment segment. Furthermore, the level of the subsidy (that is, the government subordination) was one of the criteria of the selection process. If the process was competitive, the level of subsidy would have been bid down to the minimum necessary to attract a RVCF, suggesting that entry would not have occurred in absence of the subsidy.
- 3.63 Examination of the subsidy characteristics suggests that the RVCF programme is likely to have been instrumental in the creation of venture capital funds operating in this market segment.
- 3.64 Regarding the market characteristics, in principle a venture capital fund competes in at least two markets. First, it competes with other financial intermediaries for the provision of capital to businesses, and second, it competes with other financial intermediaries for investments at the fundraising stage.
- 3.65 In both cases, we have assumed that the market affected by the subsidy is limited to the providers of equity capital, we have excluded providers of debt capital. We have also looked at possible competition effects at the level of market segments defined along the lines of the development stage, industry or firm size of the businesses funds invest in.
- 3.66 Concerning the market characteristics, the following inferences can be made:
- the UK venture capital industry is relatively fragmented, and players are diverse. In widely defined markets for venture capital provision and fundraising in the UK the nine RVCFs are small, even in aggregate. Their combined investment so far accounts for 1.2 per cent of all equity investments in UK companies at early and expansion stage from 2002 to 2004. Market shares of this size do not suggest that serious distortions of competition for businesses to invest in or for funding might have been generated by the RVCFs

- the number of venture capital funds and business angels in the UK does not suggest that entry into the venture capital market is difficult. However, it seems that profitable entry into the small-investment segment where the RVCFs are active is much more demanding. While this is not a barrier to entry in the sense that incumbents suffer from this problem as much as potential entrants, it is generally seen as the main reason for the existence of the equity gap.

Theories and evidence of actual distortions

3.67 Given that the RVCF may have made it easier to set up a fund and offer more favourable terms to businesses looking for venture capital, the following hypotheses and evidence of potential effects are presented:

- **displacement of more efficient providers of venture capital.** Interviews have confirmed that there is some overlap at the margin between the activities of RVCFs and a small number of other, specialised venture capital funds and business angels. However, at least in the case of the business angels, it appears that this relationship is characterised by cooperation. For example, RVCF often co-invest alongside business angels, rather than in competition with them. While some marginal displacement of purely private equity investors cannot be ruled out, we did not find evidence of significant competition distortions
- **the generation of increased market power.** The newly generated RVCFs might have driven other providers out of the market, or attracted a large share of the market. However, given that any displacement effects appear to have been relatively minor, this is unlikely.

Conclusions on RVCFs

- 3.68 The RVCF scheme provides preferential access to government funding to venture capital funds that are prepared to invest in the equity gap, that is, firms with equity capital requirements below £500,000. The evidence we have seen suggests that there is very little purely private venture capital activity in that market segment, which is likely due to economies of scale in investment size. Therefore some sort of subsidy was necessary for new funds to be created.
- 3.69 Given that the RVCFs operate in a market segment where very few private funds are active, and that they tend to cooperate with, rather than compete with, business angels, any displacement effects are likely to have been minimal. Further, any private venture capital fund operators that operated in the market segment of the RVCFs would have been qualified to participate in the scheme themselves.
- 3.70 The selection of the fund managers for the RVCF was set up as a bidding process, and the level of subsidy proposed was among the selection criteria. This might have promoted selection of the most efficient provider, and minimised the level of subsidy required.

Support to museum F

- 3.71 Museum F preserves a major collection of items and operates as a tourist attraction and an education facility.
- 3.72 The museum receives support from a number of public bodies. The support takes the form of one-off and annual payments.
- **one-off payments** totalled around £12 million and supported construction of the museum, acquisition of a collection, and other start-up costs
 - **annual payments** of around £400,000 support the ongoing operation of the museum. Part of the annual support is conditional on the museum not charging entrance fees and meeting performance targets (most of which are related to visitor numbers).

- 3.73 Museum F also offers corporate hospitality and conference services, and might compete with hotels, congress centres and so on. Our research suggests that museum F is not a significant player in that market, and we considered only the possible effects on tourist and leisure markets. However, a subsidy aiming at promoting cultural offerings has created a new competitor in a market the subsidies were not at all concerned with.

Inferences from the SMCs

- 3.74 The relevant subsidy characteristics suggest that the public funds received by museum F had the potential to distort competition.
- 3.75 The subsidies were selective. Museums compete with other leisure and tourist attractions, some of which are purely commercial do not get any government support. Subsidy support also varies widely between museums.
- 3.76 The subsidies were substantial and are provided on an ongoing basis. Almost all the eligible fixed costs of setting up the museum were provided through public funds. At one point, a subsidy package provided by several public bodies was needed to salvage the museum from closure. Almost 90 per cent of the museum's income now stems from public support, subject to the condition that entry is kept free.
- 3.77 The market characteristics suggest that there might have been some effect on competition.
- 3.78 Museum F is a medium-sized player among the tourist attractions in its catchment area.
- 3.79 A widely defined market, including all types of leisure and attractions in the catchment area of the museum, would be relatively fragmented. There are a wide variety of tourist attractions within 35 miles of museum F, including other museums.
- 3.80 In a narrowly defined market including only tourist and leisure attractions in the same town as Museum F, there are a much smaller number of attractions, including several museums, cinemas and theatres.

- 3.81 The different tourist attractions in the area are likely to be highly differentiated. This is particularly acute in comparison to mainly commercial attractions like cinemas or theme parks, but also considerable compared to most museums and art galleries.
- 3.82 A niche market for museums that show similar exhibitions as museum F would be very concentrated, as there are only three other such museums in F's catchment area.
- 3.83 There are likely to be costs of entry into the market museum F operates in for many of the potential competitors, though this will vary between the different types of attractions offered. For example, museums or theme parks require substantial capital investment in order to enter and revenues are likely to be low until the attraction is established in the market place.

Effects on market for tourist attractions

- 3.84 Tourist attractions are often characterised by strong complementarities. For example, museum F might not only divert visitors from nearby attractions, it might also attract more visitors into the area, from which neighbouring attractions might benefit. We used evidence on travelling distances to attractions to identify attractions that might be affected by museum F. With minor exceptions, our research suggests that other attractions in the area consider museum F a business partner rather than a competitor. It is therefore unlikely to have taken visitors from other attractions.

Theory and evidence of actual distortions

- 3.85 The subsidies are likely to have been effective in creating museum F, keeping it in the market where it would have left otherwise and prompting it to offer free entry. This leads to several potential issues.

The displacement of more efficient suppliers

- 3.86 Museum F might have attracted visitors who would otherwise have gone to other, potentially more efficient, publicly funded or purely commercial attractions.
- 3.87 The market characteristics suggest that in a wide product market including all types of tourist attractions, museum F would be a mid-sized player among a relatively large number of alternative offerings. This suggests that any displacement effects arising from the subsidy would be moderate at best.
- 3.88 As discussed in paragraph 3.84, tourist attractions are often characterised by strong complementarities. From interviews with a sample of other operators of tourist and leisure attractions in museum F's catchment area most consider museum F a business partner rather than a competitor. Therefore museum F is unlikely to have reduced the other attractions' visitor numbers.

The generation of increased market power

- 3.89 The creation of a strong new player in the market, perhaps augmented by other attractions exiting the market, might have resulted in an increase of market power. There has been no evidence of substantial displacement effects following the entry of museum F. Museum F has not become a major player if all tourist attractions within 35 miles are considered to belong to the relevant market, and is not the main player even under plausible narrow market definitions. It is therefore unlikely that market power has increased.

The prevention of new entry

- 3.90 Museum F might have deterred other attractions from entering the market by offering free entry, which a potential entrant felt they could not compete against. As there might be some competition at the margin between museum F and commercial attractions, the possibility that its presence in the market makes a critical difference to the entry decision of a potential newcomer cannot be ruled out entirely.

Conclusion: museum F

- 3.91 Museum F has received a substantial amount of support from public bodies. It is highly likely that without heavy subsidy of the setting up and running costs of the museum, it would not have come into being and would certainly not have had a free entry policy.
- 3.92 Museum F is a medium-sized player among the tourist attractions in its catchment area, and – unless a very narrow niche market including museums with similar types of exhibitions only is used – operates in a relatively fragmented market characterised by high product differentiation. These characteristics suggest that displacement effects on competitors are likely to be minor, although some effects might be felt by nearby attractions that depend mainly on a local audience.
- 3.93 Museum F funds itself in part by offering corporate hospitality and conference services. While it does not appear to be a serious player in this business, it is worth noting that a subsidy aimed at promoting a new cultural offering has created a new competitor in a completely different market.

4 CONCLUSIONS

- 4.1 In most of the six case studies, particularly A, B and D, the subsidy characteristics suggest that the subsidies could have materially distorted competition. Whether they would in fact have done so depends on the market characteristics. Accordingly, this creates a theoretical case for undertaking market assessments of public subsidies.
- 4.2 In two of the six cases – both involving regional grants – the market characteristics suggest that the competitive process is likely to have been affected by the subsidy:
- in firm D through a direct impact on market output, and
 - in firm A, more probably through influencing which capacity remained in the market and which capacity exited.
- 4.3 In D there is some evidence to support the hypothesis of a competition distortion.
- 4.4 Our sample has only six instances, but there are very many subsidies. Moreover, the market characteristics identified by the OFT are likely to arise only in a sub-set of markets. Despite this, in two of the six cases the subsidies may have had a material impact on competition.