HCA Hospitals

World-Class Healthcare

HCA INTERNATIONAL LIMITED

Response to Competition Commission's Provisional Findings

APPENDICES

11 November 2013

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1. APPENDIX 1: FUTURE GROWTH OF PPUs

Summary

1.1 The likely growth of Private Patient Units (PPUs) in London means that they will place an increasingly important competitive constraint on other hospital operators in London. This appendix sets out further evidence collected by HCA on:

- The importance of the factors limiting PPU growth mentioned by the CC;
- The trends in PPU growth in London over the last three years, illustrating that in practice the factors limiting PPU growth in London are not significant; and
- The expected growth of London PPUs in future.

1.2 This Appendix proceeds as follows:

- **Section 2**: summarises the evidence on whether any potential constraints on growth apply to PPUs' growth in London;
- **Section 3**: summarises the evidence available on the level of PPU service growth in London over the last three years;
- **Section 4**: summarises the evidence available on the future growth plans of London PPUs; and
- **Annex**: sets out the information collected from the annual reports and other relevant documents of London NHS Trusts/Foundation Trusts on their plans for private patient service growth.

1.3 This Appendix should be read alongside HCA's prior submissions to the CC on the competitive constraint on HCA from PPUs in London.[1]

Evidence of constraints on PPU service growth in London

1.4 In its PFs, the CC has commented that for those PPUs with concrete plans to develop their private patient services, including some based in London, there remain significant hurdles which may prevent wholesale expansion, and that the Trusts' main priority is to serve NHS patients.[2]

1.5 Such hurdles identified only for smaller PPUs include:

- Patients being unsatisfied with facilities without capital investment;
- Political pressure; and
- Weaker commercial and contracting capabilities.

[1] See, for example, HCA's response to the Issues Statement, HCA's response to the Annotated Issues Statement, HCA's response to the CC's working paper, "Private healthcare in central London: Horizontal competitive constraints".
[2] CC, PFs, appendix 3.1, para. 25.

1.6 The PFs asserted that, whilst many London-based PPUs are investing or contemplating investment with a view to increasing private patient income, it does not appear that this will provide additional significant competitive constraints on private hospital operators in London in the short term. The reasoning behind this assertion appears to include:[3]

- Being disadvantaged by pricing pressures ;
- Lack of insurer recognition;
- Capacity constraints;
- Inability to offer dedicated access;
- Inability to attract consultants to undertake private patient work; and
- Requirement to cede to NHS priorities.

1.7 Below, HCA addresses each of the above factors. In doing so, it is evident that the factors above do not apply to, or are more readily overcome by, PPUs in London. Furthermore, the CC has provided no evidence that the factors it identifies specifically limit PPU expansion in London.

Being disadvantaged by pricing pressures

1.8 Prices are a matter of negotiation between insurers and providers and addressable by providers. In pricing their services, PPUs enjoy a number of advantages over private operators, as stated in HCA's previous submissions.[4] For example, NHS Trusts'/Foundation Trusts' cost profiles may facilitate a pricing structure that is advantageous rather than disadvantageous in competing for private patients.

1.9 AXA PPP's response to the PFs illustrated that PPUs were not at a price disadvantage compared to private operators, stating that: "*PPUs, particularly in London, often have access to high acuity services and potentially lower cost diagnostics and consumables than stand-alone private hospitals. These dynamics should mean PPUs are able to compete effectively on price, whilst also offering access to high acuity facilities*".[5]

Lack of insurer recognition

1.10 Insurer recognition is associated with a number of factors about the service that can be influenced by provider behaviour, such as the quality of care and facilities and customer services. Many NHS Trusts / Foundation Trusts do have insurer recognition for private patient services,[6] demonstrating that PPUs are capable of meeting insurers' criteria for recognition.

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[3] CC, PFs, appendix 3.1, para. 11.
[4] Most recently within section 4 of HCA's Response to the CC's Private Healthcare in central London: Horizontal Competitive Constraints paper, dated 28 June 2013.
[5] AXA PPP healthcare Limited ("AXA PPP") feedback to the Competition Commission ("CC") on the provisional findings and notice of possible remedies, para. 2.44.
[6] See, for example, the hospital network lists for Bupa, AXA PPP, Aviva, PruHealth and SimplyHealth, all of which contain a vast number of PPUs based in London.

Capacity constraints

1.11 The expansion of PPUs operated by NHS Foundation Trusts was previously been limited due to the caps in place on the revenue they are allowed to earn from private patients.

1.12 An analysis of the annual reports and forward plans of central London NHS Trusts and NHS Foundation Trusts is summarised in the Annex to this Appendix. This analysis shows that a number of NHS Trusts and Foundation Trusts have increased private patient capacity over the last three years and also used existing capacity for private patient services more intensively.

1.13 Changes within the NHS are also expected to drive expansion of capacity. The requirement to deliver NHS efficiency savings[7] is driving NHS providers to utilise their assets more efficiently in order to remain within declining NHS budgeted cost limits. This is freeing up capacity that Trusts can re-purpose to manage additional private patient activity.

1.14 The CC itself noted in the PFs that some NHS Trusts are not operating at their private patient cap maximum and there is plenty of scope for further expansion.[8] The PFs stated that the private patient income cap significantly limited the potential of specialty PPUs to increase activity and income from private patient services and that lifting it would allow them to increase their overall revenue: "*Some specialty PPUs told us that the lifting of the cap would allow them to meet the needs of private and public patients better, and that they expected moderate growth, which would enable some renewal of equipment and facilities*".[9]

1.15 HCA operates in London where most PPUs are larger and also offer specialist services. The impact of lifting the private patient cap on larger and specialist PPUs is considered by the CC in the PFs[10] and the CC's findings indicate that lifting the private patient cap will increase the ability of NHS Trusts/Foundation Trusts to increase private patient revenue.

Inability to offer dedicated access

1.16 The ability to offer dedicated access is capable of being addressed by NHS Trusts. The ongoing expansion of PPUs, providing dedicated capacity for private patient treatment, and the ongoing drive for efficiencies in the provision of NHS services, freeing up capacity previously used to deliver NHS services, means that NHS providers will increasingly be able to deliver dedicated access to services for private patients. A number of examples of PPUs developing dedicated access for private patients are set out in the Annex to this Appendix, including, among others, Granard House at the Royal Marsden, four dedicated private facilities at Imperial College Healthcare, a dedicated private cancer and haematology centre at University College London Hospitals and plans by the Royal National Orthopaedic for its Stanmore site.

[7] For example, the “Nicholson challenge", as explained at para. 1.30.
[8] CC, PFs, appendix 3.1, para. 21.
[9] CC, PFs, appendix 3.1, para. 22.
[10] CC, PFs, appendix 3.1, paras. 19 – 21 and 22 – 23.

Inability to attract consultants to undertake private patient work

1.17 NHS Trusts / Foundation Trusts are in a much stronger position than private hospital operators to attract consultants to undertake private patient work. Most consultants who undertake private patient work also undertake NHS work and are based at NHS Trust / NHS Foundation Trust hospitals.

1.18 NHS Trusts can often match the clinical support services provided to consultants by private hospital operators, and have the additional advantage of being able to offer private patient facilities at the same site at which consultants conduct their NHS activity, so consultants do not need to travel to undertake their private practice. Furthermore NHS Trusts / Foundation Trusts can offer additional benefits that private hospital operators cannot match, such as access to a broad range of supporting clinical facilities and medical and clinical expertise, and the ability to readily transfer patients between private and NHS care if needed.

1.19 This view was noted by AXA PPP in its response to the PFs, as follows: "*PPUs [...] can be attractive for consultants who do not wish to travel to another hospital*". [11]

Requirement to cede to NHS priorities

1.20 NHS Trusts are required to prioritise NHS activities. However, NHS Trusts can and do organise their activities so that NHS priorities do not detrimentally impact on private activities and income, as evidenced by a number of Trusts in London generating significant revenue through PPUs while continuing to be high performing organisations in the delivery of core NHS services.

1.21 The PFs stated that some of the larger PPUs were already contemplating a strategic approach which incorporates an increase in private patient income by refurbishing facilities, widening the scope of services and attracting new consultants.[12] The CC stated that there are "*Efforts being made to position themselves to expand and take advantage of the lifting of the cap are evident*".[13] HCA contends that this action is being undertaken by the majority of PPUs in London and provides evidence of this in the sections below.

1.22 In AXA PPP's response to the PFs, it noted that the current trend towards outsourcing the development and running of PPUs to third party providers "*could help PPUs develop and be up and running more quickly than they otherwise could have achieved if the development and management was the responsibility of the NHS trust*".[14]

Evidence of PPU service growth in London over the past three years

1.23 During the course of the CC's inquiry significant expansion in NHS PPUs has already started to take place. Planning for expansion started in 2011 in anticipation of the Health and Social Care Act 2012.

1.24 Data collected from their Annual Accounts, set out in **Table** A1.1 and illustrated in **Figure** A1.1 below, shows that the private patient earnings of the 12 NHS Trusts / Foundation Trusts based in central London grew by an average of 36% over the last three years.

[11] AXA PPP feedback to the CC on the PFs and Remedies Notice, para. 2.103.
[12] CC, PFs, appendix 3.1, para. 19.
[13] "CC Private healthcare market investigation Appendix 1.1", page A(3)1-8, para. 19.
[14] AXA PPP feedback to the CC on the PFs and Remedies Notice, para. 2.107.

This growth meant that in 2012/13 these 12 PPUs accounted for a total private patient spending of £285 million. Given that the CC estimates the total size of the market for private healthcare in central London at around £1 billion,[15] this would mean that PPUs represent 28% of private healthcare revenue in central London.

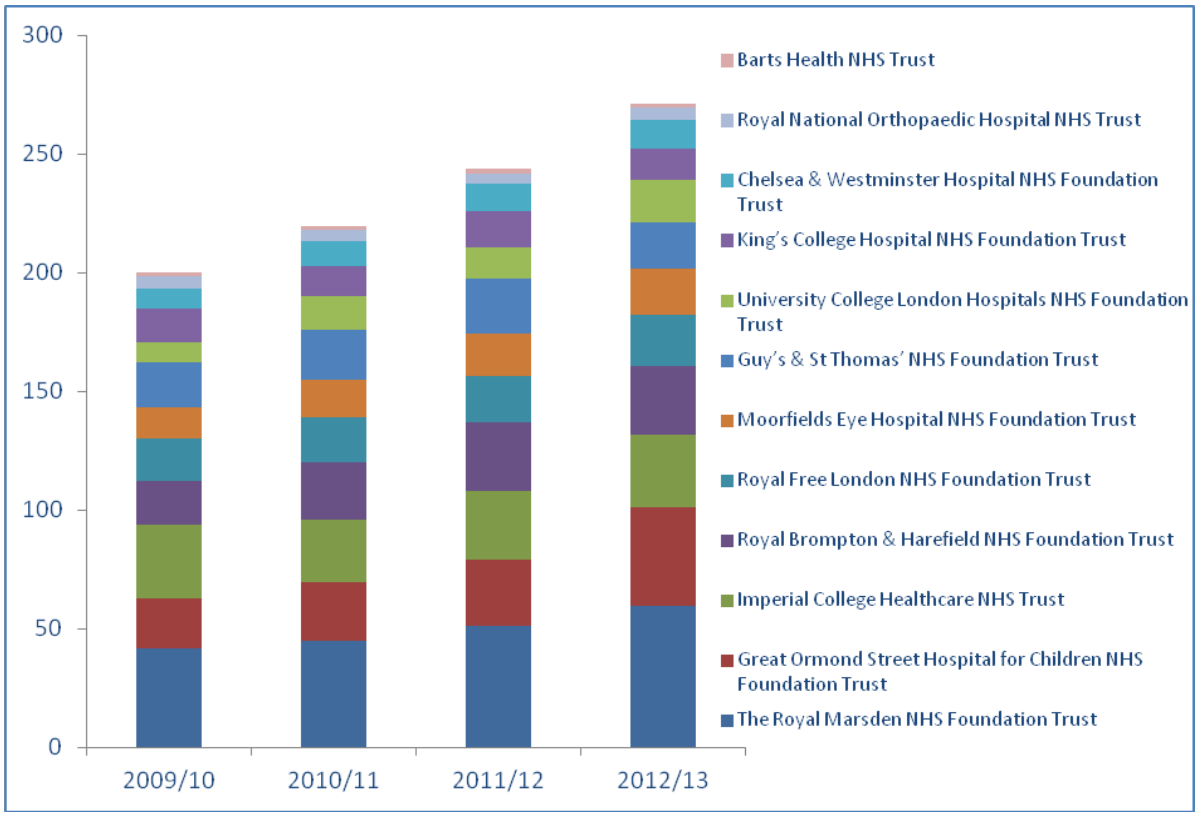
Table A1.1: NHS Trusts'/Foundation Trusts' private patient earnings, central London, 2009/10–2012/13

£m	2009/10	2010/11	2011/12	2012/13	% change 2009/10 – 2012/13
The Royal Marsden NHS Foundation Trust	41.7	44.7	51.1	59.8	43%
Great Ormond Street Hospital for Children NHS Foundation Trust	21.0	25.1	30.1	44.0	110%
Imperial College Healthcare NHS Trust	34.3	31.2	30.6	32.3	-6%
Royal Brompton & Harefield NHS Foundation Trust	19.0	24.8	29.4	29.2	54%
Royal Free London NHS Foundation Trust	18.5	19.0	20.0	22.6	22%
University College London Hospitals NHS Foundation Trust	9.0	16.0	15.3	20.5	128%
Moorfields Eye Hospital NHS Foundation Trust	13.4	16.2	17.9	19.5	46%
Guy's & St. Thomas' NHS Foundation Trust	19.1	21.0	23.1	19.2	0%
King's College Hospital NHS Foundation Trust	14.9	13.3	16.9	15.7	5%
Chelsea & Westminster Hospital NHS Foundation Trust	9.3	10.8	11.3	11.9	29%
Royal National Orthopaedic Hospital NHS Trust	5.4	4.4	4.1	5.0	-7%
Barts Health NHS Trust	3.5	4.0	4.9	4.9	39%
Total	**209.1**	**230.6**	**254.6**	**284.6**	**36%**

Source: NHS Trust / NHS FT Annual Accounts. 2009/10 and 2010/11 figures for Barts Health were obtained by summing the respective figures from the annual reports of Barts and The London NHS Trust, Newham University Hospital NHS Trust and Whipps Cross University NHS Trust, which merged to form Barts Health NHS Trust in 2012.

[15] CC, PFs, appendix 6.3, para. 27.

Figure A1.1: NHS Trusts / Foundation Trusts private patient earnings, central London, 2009/10–2012/13



Source: NHS Trust / NHS Foundation Trust Annual Accounts

1.25 PPUs in central London have been growing rapidly and indeed faster than other private healthcare providers. The CC found that private hospital revenue in central London has been growing at around 8% a year since 2009, whilst the corresponding annual growth rate for PPUs over the same period has been 11%.

1.26 Based on information collected on the private patient plans of NHS Trusts/Foundation Trusts (summarised in **Table** A1.2 below and set out in the Annex), 11 of the 12 central London NHS Trusts / Foundation Trusts have expressly referred to their private patient strategies in their annual reports over the last three years and nine make reference to plans to grow their private patient activity. Seven of the nine central London NHS Foundation Trusts included particular references to the lifting of the private patient activity cap. The undertaking of significant refurbishment work on the private patient facilities at four Trusts was mentioned in their annual reports. Also highlighted was the appointment of new senior staff at three of the Trusts in relation to their private patient services.

1.27 In addition, three London NHS Trusts/Foundation Trusts made specific mention of measures they had undertaken in the last three years with the aim of attracting more private patients. These measures included: creating a new website for international and private patients; rebranding the private patient offering; publishing a brochure; targeted marketing; and reviewing the patient enquiry line.

Table A1.2: Topics mentioned by NHS Trusts / Foundation Trusts in their annual reports, 2009/10–2012/13

	Private patient strategy	Plans to grow private patient activity	Private patient activity cap
The Royal Marsden NHS Foundation Trust	Y	Y	Y
Great Ormond Street Hospital for Children NHS Foundation Trust	Y	Y	Y
Imperial College Healthcare NHS Trust	Y	(Y)[16]	n/a
Royal Brompton & Harefield NHS Foundation Trust	Y	Y	Y
Royal Free London NHS Foundation Trust	Y	Y	
Moorfields Eye Hospital NHS Foundation Trust	Y	Y	Y
Guy's & St. Thomas' NHS Foundation Trust	Y	Y	Y
University College London Hospitals NHS Foundation Trust	Y		
King's College Hospital NHS Foundation Trust	Y	Y	Y
Chelsea & Westminster Hospital NHS Foundation Trust	Y	Y	Y
Royal National Orthopaedic Hospital NHS Trust	Y	Y	n/a
Barts Health NHS Trust			

Source: NHS Trust / NHS Foundation Trust Annual Accounts

1.28 Further detail on the plans of central London NHS Trusts / Foundation Trusts for private patient service growth is given in section 6 of this submission.

Evidence of planned future expansion of PPUs in London

1.29 The previous section showed that private patient revenue in central London NHS hospitals has risen by 37% over the period 2009/10–2012/13 to reach £285 million. This high rate of growth is expected to continue.

1.30 An explanatory factor for why NHS Trusts are looking to increase private patient income stems from various financial pressures, including the need to deliver the "Nicholson challenge" set by the Chief Executive of the NHS. This requires improvement in quality whilst making efficiency savings of £20 billion between 2011 and 2015.

1.31 One example of expansion is the Royal Marsden NHS Foundation Trust. Its private patient income has increased by 43% over the three-year period from 2009/10 to 2012/13. Its Forward Plan 2012–13 states:

[16] Whilst Imperial do not appear to have publicly stated their intention to expand their private patient offering, market intelligence (discussed in section 6) indicated that it was in currently discussions with a prominent developer regarding the creation of new private healthcare facilities.

Royal Marsden NHS Foundation Trust Forward Plan 2012–13

"The reduction in NHS spending, and the impact of a tariff and pricing mechanism which currently disadvantages organisations providing the most specialist and complex services, means that The Royal Marsden must achieve significant savings during the period of this strategy. A key element of financial stability will be successful delivery of the Trust's Commercial Strategy, and the ongoing success of its private patient service. This is supported by the completed development of new Private Care facilities on both of the Trusts' main sites including new outpatient facilities and a 25% growth in inpatient private bed facilities on the Chelsea site. With the completion of a recent market analysis it is clear there is potential for greater development of the private care work currently provided by The Royal Marsden. To that end a new Private Practice Business Strategy is being developed looking to secure and increase new and existing markets both within the UK and abroad and ensure appropriate opportunities are exploited for the benefit of the wider organisation and all its patients. This strategy will be competed during 2012/13.

Demand for services to private patients has consistently exceeded the Trust's ability to accept referrals. Plans assume current private capacity will be extended into Wiltshaw ward at Chelsea from the end of 2012; with only modest capital refurbishment.

Without new investment in hospital capacity any further increase in private capacity is likely to require a reduction in NHS capacity. Plans to do so will need to reflect the efficiency programme (particularly for length of stay and similar metrics) and any decommissioning of financially unviable activity".

"Governors agreed to the development and implementation of a strategy for an increase in private activity. This is expected to achieve a business of £100m (50–60%) increase as soon as realistically possible. Governors recognised that although this strategy will be delivered over a number of years it was important to agree the longer term strategy now; rather than by incremental changes through board and council".

"Governors discussed the underlying financial performance and noted that the key drivers of surplus were the efficiency programme and private patient activity".

1.32 Another example is King's College Hospital NHS Foundation Trust:

King's College Hospital NHS Foundation Trust Forward Plan Strategy Document for 2012–13

"To secure the Trust's financial position going forward, the following priorities have been proposed for each of the relevant objectives ……..

- The identification of new income streams including increased private patient work, taking advantage of the relaxation of the Private Patient Income cap".

"Income diversification is a key strategic opportunity, and we are developing our Private Patient and Commercial services".

"The current commercial strategy is framed around a number of discrete sectors where there is considered to be commercial opportunity:

- Information systems
- Private patients
- Outsource services
- Overseas opportunities
- Other IP development and commercial trials

It is intended that over the period of this plan KCH Commercial Services will seek to maximise opportunities within these sectors".

1.33 In AXA PPP's response to the PFs it stated that "*the market will see an increasing number of NHS hospitals wanting to develop private facilities and there is evidence of this in central London – which also has been [sic] largest opportunity*".[17]

1.34 HCA has previously provided further examples of the expansion plans of PPUs in London in its response to the CC's London Working Paper on Private Healthcare in central London.[18]

[17] AXA PPP feedback to the CC on the PFs and Remedies Notice, para. 2.107.
[18] HCA, Response to CC working paper "Private healthcare in central London: Horizontal competitive constraints", paras. 4.11–4.12.

Annex – Evidence from the annual reports of London Trusts

1.35 Below HCA outlines qualitative evidence on the plans for private patient service growth taken from the annual reports (2010/11 to 2012/13) and other relevant documents of central London NHS Trusts / Foundation Trusts.

The Royal Marsden NHS Foundation Trust

- Private patient income at the Royal Marsden increased by 43% from 2009/10 to 2012/13, with private patients generating income of almost £60 million in 2012/13.[19]
- The Royal Marsden's private patient facilities have undergone significant investment over recent years, including Granard House in Chelsea being reopened in 2011 following large scale extensions and modifications and Wiltshire Ward being reopened in 2013 following major refurbishment.
- In 2012/13, the Royal Marsden appointed to the new created role of Divisional Medical Director, Private Care.

1.36 Key passages from the Annual Report(s) include:

1.37 "*Patient income is supplemented by income to provide infrastructure support for research and development activity and from private patient income. The margin delivered on our private patient income remains a vital source of support for NHS services to patients. Private income is expected to continue to grow, though it is expected to remain within the private patient income 'cap' set out in the Trust's Terms of Authorisation*".[20]

1.38 "*Final schemes in Chelsea due to open in 2011 include the redevelopment of our Palliative Care Ward, our private inpatient facilities, and the installation of the latest imaging and radiotherapy technology with the introduction of a PET / CT scanner and CyberKnife for the first time. Chelsea represents the very best in modern technology and patient environment for the comprehensive treatment and care of patients to the very highest international standards*".[21]

1.39 "*Granard House, our private care wing in Chelsea, reopened in the summer of 2011 after a £6 million modernisation and expansion programme. There are now 21 single en-suite private rooms over three floors and a refurbished outpatient area with five consulting rooms*".[22]

1.40 "*Granard House, the dedicated private care wing at The Royal Marsden in Chelsea, reopened its doors to patients last summer. The new facilities now provide double the amount of single en-suite private rooms and a refurbished outpatient suite, with five consulting rooms and a waiting area. Kate Hall, Matron and Service Manager for Private Care, said: "Everything has been built to the highest clinical and infection control standards to provide an exceptional standard of care*".[23]

[19] See Table A1.1 above.
[20] Annual Report 2010/11, page 82
[21] Annual Report 2010/11, page 5
[22] Annual Report 2011/12, page 3
[23] Annual Report 2011/12, page 10

1.41 "*Wiltshaw and Burdett Coutts wards re-opened in January 2013 after a period of renovation. As part of the considerable development and renovation of the Chelsea site over the past few years, the opening of Wiltshaw Ward in particular was a significant milestone in the final stages of whole site redevelopment. Wiltshaw Ward will be predominantly used for Private Care alongside the Granard House development which was completed in 2011*".[24]

1.42 "*In a challenging economic environment the Trust has continued to deliver its efficiency targets in 2012/13. This programme of efficiency has delivered improvements in order to meet NHS tariff reductions, to support the local health economy and to provide a surplus of £6.3m for development [...] The efficiency programme is comprised of initiatives which will increase private income with less, or no, increase in costs and those which reduce costs with less, or no, reduction in income*".[25]

1.43 "*NHS patient income is supplemented by income to provide infrastructure and support for research and development activity and from private patient income. The margin delivered on our private patient income remains a vital source of support for NHS services to patients*".[26]

Great Ormond Street Hospital for Children NHS Foundation Trust

- Great Ormond Street Hospital's (GOSH) International and Private Patient activity has risen by 110% in the last three years, up from £21.0 million in the year ending 31 March 2010 to £44.0 million in the year ending 31 March 2013.[27]
- This growth in income was realised through the planned opening of all of the beds in the international division to a maximum of 43.
- Following the relaxation of the private patient income cap, GOSH recruited staff to open a total of eight additional beds and two dedicated intensive care beds to provide greater capacity for specialist work in London and increase the ability to accept urgent referrals.
- GOSH revised its international and Private Patient Strategy for 2013/14, including plans to increase the number of cardiac and nephrology patients using currently unresourced beds with additional staffing.
- GOSH relaunched its website in November 2011, and a new site for international and private patients with content in English and Arabic went live in April 2012.

1.44 Key passages from the Annual Report(s) include:

1.45 "*The International Private Patients (IPP) Division provides almost the full range of specialist services offered by GOSH to private and international patients*".[28]

1.46 "*The removal of the cap on income earned from non-NHS activities means that in the coming year, IPP will recruit staff to open a total of eight additional beds and two dedicated intensive care beds. This will provide greater capacity for specialist work in London and increase the ability to accept urgent referrals. The unit will also access additional MRI capacity to improve access to this diagnostic service. Marketing in the Gulf region will be*

[24] Annual Report & Accounts 2012/13, page 8
[25] Annual Report & Accounts 2012/13, page 99
[26] Annual Report & Accounts 2012/13, page 100
[27] See Table A1.1 above.
[28] Annual Report 2011/12, page 19

enhanced to raise the profile of GOSH as a world-class, specialist children's hospital and encourage referrals to GOSH rather than to Germany, the US and Canada".[29]

1.47 "*The GOSH website was relaunched in November 2011. A new site for international and private patients with content in English and Arabic went live in April 2012*".[30]

1.48 "*In 2012-13 IPP clinical income delivered a growth of over 40% from the previous financial year. This was achieved through the planned opening of all of the beds in the international division to a maximum of 43…*"[31]

1.49 International and Private Patients at Great Ormond Street Hospital*: "The division has completed a workforce review of clinical and non-clinical staff and a restructure has been implemented to improve the clinical leadership and quality of the patient experience. An annual plan of patient surveys has also been developed for next year.*

The relaxation of the private patient income cap as part of the Health and Social Care Act 2012 enabled the IPP strategy to be revised for 2013/14. A group was configured consisting of executives, non-executives, Members' Council representatives and IPP staff. Recommendations were made and accepted at the Trust Board and Members' Council. The strategy for next year has three main streams:

1. *Treatment in London: In 2013/14 there will be an increase in the numbers of cardiac and nephrology patients by using currently unresourced beds with additional staffing.*

2. *Education and training and consultancy: The plan is to continue in Kuwait and other opportunities will be assessed as they arise.*

3. *Treatment overseas: Opportunities are being explored to provide treatment overseas and, if any proceed, a scoping exercise will need to be completed*".[32]

Imperial College Healthcare NHS Trust

- Imperial College Healthcare NHS Trust's (ICH) private patient income reached £32.3 million in 2012/13, an increase of 5% from 2011/12.[33]

- ICH describes its private patient income as an important source of revenue to the Trust, and this has been emphasised in recent annual reports.

- ICH has been investing in its PPUs. Its high profile private patient Lindo Wing was fully refurbished and reopened in June 2012.

- ICH has also sought to raise the profile of its PPUs. In 2011 ICH undertook a complete rebranding exercise for its private patient offering. This exercise aimed to reinforce private healthcare at Imperial College Hospitals as one of the leading private suites in the world and to be strong enough to appeal to a variety of cultural needs. This exercise included rebranding, including the new name of Imperial Private Healthcare being developed alongside the logo, branding and photography and the production of a full range of marketing literature. A newly branded Imperial Private Healthcare brochure was

[29] Annual Report 2011/12, page 19
[30] Annual Report 2011/12, page 34
[31] Annual Report 2012/13, page 13
[32] Annual Report 2012/13, page 26
[33] See Table A1.1 above.

published in 2011, describing the private patient services available at different facilities managed by the Trust.

- In February 2012 ICH appointed one of its consultants to the newly created post of Lead Clinician, Imperial Private Healthcare.

1.50 Key passages from the Annual Report(s) include:

1.51 "*We have also invested in future income generation by refurbishing the private healthcare facility at St Mary's Hospital*".[34]

1.52 "*Our private healthcare service is an important source of revenue to the Trust which is re-invested into NHS services within our hospitals. During 2011/12, our private facility at St Mary's Hospital, the Lindo Wing, has been closed for a major refurbishment. The facility will reopen early in the financial year 2012/13*".[35]

1.53 "*Following an extensive refurbishment, the Lindo Wing at St Mary's Hospital re-opened in June 2012 and now provides the highest quality of care for surgical, medical and obstetric patients*".[36]

1.54 "*Our private healthcare facility at St Mary's Hospital officially reopened in June 2012, following an extensive refurbishment of the Lindo Wing. The Lindo Wing is one of the top private sites in the country for general and maternity services, and one of our four dedicated private facilities. A number of historic births have taken place in the unit over the years, including Prince William in 1982, Prince Harry in 1984, and the latest addition to the Royal Family, Prince George, who was born on 22 July 2013. The 18 month refurbishment project involved the reconfiguration of the existing layout, creating three new state-of-the-art theatres and patient stay facilities, offering an increased level of comfort for our private patients*".[37]

1.55 "*We offer the choice of private healthcare within dedicated units at the Trust. This offers world-class consultant-led care and provides the peace of mind to patients who choose to be seen privately, that they have access to a whole range of services including critical care, coronary care, state-of-the-art diagnostics and specialist operating theatres, 24 hours a day, 365 days a year. We welcome UK insured, self-paying and international patients*".[38]

1.56 "*Our private healthcare service is an important source of revenue to the Trust which is re-invested into NHS services within our hospitals*".[39]

Royal Brompton & Harefield NHS Foundation Trust

- Private patient income at Royal Brompton and Harefield Foundation Trust (RBH) has increased by 54% from 2009/10 to 2012/13, generating income of over £29 million in 2012/13.[40]

[34] Annual Report 2011/12, page 5
[35] Annual Report 2011/12, page 8
[36] 2012/13 Annual Report, page 9
[37] Annual Review 2012/13, page 7
[38] 2012/13 Annual Report, page 9
[39] 2012/13 Annual Report, page 9
[40] See Table A1.1 above.

- In its 2012/13 Annual Plan, RBH has noted an opportunity to generate funds through private patient services following the removal of the private patient activity cap in 2012.

1.57 Key passages from the Annual Report(s) include:

1.58 "*Funds generated from clinical activities: Another opportunity will be in private patient services where the new Health and Social Care Act has substantially reduced the constraints over growth. The financial projections incorporate our assumptions on incremental revenues*".[41]

1.59 "*The potential raising of the 'cap' on Foundation Trusts' private patient activity as a percentage of total clinical income to 49% could lead to some financial protection against increasing NHS tariff / volume uncertainty. However maintaining sensible pricing positions while increasing volumes of activity is unlikely to be achieved on a 'more of the same' basis, especially with some insurers' aggressive moves against consultant fee levels and plan coverages. Embassy and overseas patient flows may become contingent on more specialist activities and services we have yet to develop, such as training programmes for overseas medics and nurses. We consequently need to formulate a new strategy for our private patients business to address these issues*".[42]

Royal Free London NHS Foundation Trust

- Private patient income at the Royal Free has increased by 14% from 2011/12 to 2012/13, generating income of almost £22 million in 2012/13.

- In its published Five Year Plan, one method the Royal Free has identified to gain new markets and income sources is "exploring opportunities to take our services to a bigger population, within both the NHS and the private sector".

Moorfields Eye Hospital NHS Foundation Trust

- Private patient income at the Moorfields Eye Hospital (MEH) increased to almost £20 million in 2012/13, an increase of around 9% from 2011/12.[43]

- MEH considers that the lifting of the private patient cap, which limited the amount of income it was allowed to make from private patient activities, provides an opportunity to exploit its brand and its expertise and grow its commercial activities without impacting on NHS activity.

- MEH has started discussions to launch a private patient service at its larger satellite centres at Northwick Park and Bedford, in order to gain increased market share and boost financial returns, and is reviewing its patient enquiry line and practice administration arrangements, with a view to ensuring that as many enquiries as possible result in new appointments being made.

- 2012/13 saw the appointment of several new consultants and a new managing director, who has significant expertise in both the NHS and the private healthcare sectors, to Moorfields Private.

[41] Annual Plan 2012/13, page 8
[42] Annual Plan 2012/13, page 10
[43] See Table A1.1 above.

1.60 Key passages from the Annual Report(s) include:

1.61 "*Moorfields Private is located on and adjacent to the main City Road hospital and also has facilities in Wimpole Street.*

The division experienced a small, but encouraging, upturn in activity during 2010/11. This increase, combined with in-year improvements made to business processes, resulted in a much improved income position at the year end. Moorfields Private recorded a surplus of £2.6 million for the year.

Capital investment in the John Saunders outpatient consulting room suite provided for refurbishment and reorganisation of the facilities and enabled the division to improve the care environment and to purchase new equipment, which allowed for more comprehensive diagnostic and clinical support services both for patients and consultants".[44]

1.62 "*Moorfields Private is located on and adjacent to the main City Road hospital and also has facilities in Wimpole Street. The division had another successful year, with several new consultants joining our team. Coupled with some targeted marketing, these new appointments resulted in a significant increase in new patient referrals. For 2011/12, Moorfields Private recorded a surplus of £2.6 million.*

The strategy for growth continues to focus on the creation of additional surgical capacity at the main City Road hospital to meet the requirements of the new consultant cohort, on providing a more comprehensive range of outpatient diagnostic services and, in time, on introducing Moorfields Private services in our NHS satellite locations".[45]

1.63 "*Our strategy remains aligned with the main thrust of the Health and Social Care Act 2012; namely, to place patients at the heart of all we do, focus on improving further clinical safety and outcomes, and continue to lead the way in providing more ophthalmic care in community and primary care settings. The lifting of the private patient cap, set out in the act, will also enable further income growth opportunities*".[46]

1.64 "*Commercial business development – use the opportunities available with the changes to the private patient cap to exploit the brand and our expertise to generate new areas of business*".[47]

1.65 "*Despite the difficult financial climate, our three commercial divisions returned a joint surplus of £3.64 million in 2012/13. For the future, the lifting of the private patient cap, which limited the amount of income we were allowed to make from private patient activities, provides us with an opportunity to grow our commercial activities, without impacting on our NHS activity, which remains our main focus*".[48]

1.66 "*This year saw the appointment of several new consultants and a new managing director, who has significant expertise in both the NHS and the private healthcare sectors*".[49]

1.67 "*During 2012/13, the management team worked to identify new premises to enable the integration of its outpatient consulting and refractive laser services in the John Saunders*

[44] Annual Report 2010/11, page 17
[45] Annual Report 2011/12, page 31
[46] Annual Report & Accounts 2012/13, page 12
[47] Annual Report & Accounts 2012/13, page 39
[48] Annual Report & Accounts 2012/13, page 43
[49] Annual Report & Accounts 2012/13, page 44

Suite and Arthur Steele Unit into one location. This would improve the overall environment in which services are provided and which fee-paying customers expect, as well as provide additional capacity to accommodate new consultants. Discussions also started to launch a private patient service at Moorfields' larger satellite centres at Northwick Park and Bedford, in order to gain increased market share and boost financial returns. Cumberlege Ward was extensively refurbished during 2012/13, providing much improved facilities for those who require an overnight stay following surgery".[50]

1.68 "*Reviews are now underway of the patient enquiry line and practice administration arrangements, with a view to ensuring that as many enquiries as possible result in new appointments being made, and improving the efficiency and quality in the management of private practice. The reviews continue and change will be introduced in the early part of 2013/14*".[51]

Guy's & St. Thomas' NHS Foundation Trust

- Guy's has entered into an agreement with HCA to run a private patient cancer services unit.
- Guy's has identified growing its private inpatient, medical and maternity services at St. Thomas' as a key commercial opportunity moving forward.

1.69 Key passages from the Annual Report(s) include:

1.70 "*In accordance with Foundation Trust legislation, the Trust's private patient income is capped at 3.04 per cent of income from patient care activities based on the Trust's 2002/03 financial outturn. The Trust remained within the private patient cap for 2010/11. Our future plans assume that private income will remain constant in real terms, and that we will therefore remain within the required limit*".[52]

1.71 "*The Trust has a long tradition of innovation, ranging from medical breakthroughs and translational research to capitalising on commercial opportunities which allow us to generate additional income that supports the delivery of our NHS services. Major initiatives this year have included:*

- *securing a preferred bidder to work with us to deliver enhanced private patients services in a partnership that will form a key part of the new Cancer Treatment Centre at Guy's…"*[53]

1.72 "*In accordance with Foundation Trust legislation, the Trust's private patient income is capped at 3.04 per cent of income from patient care activities based on the Trust's 2002/03 financial outturn. The Trust remained within the private patients cap for 2011/12. The new Health and Social Care Act gives the Secretary of State the powers to abolish the Private Patient Cap*".[54]

1.73 "*The Trust benefits from having one of the largest and most successful commercial directorates in the NHS. Safeguarding our future by ensuring that we continue to be*

[50] Annual Report & Accounts 2012/13, page 44
[51] Annual Report & Accounts 2012/13, page 44
[52] Annual Report 2010/11, page 24
[53] Annual Report 2011/12, page 10
[54] Annual Report 2011/12, page 25

financially sustainable is critical to the delivery of clinical services. This team supports and develops a range of initiatives to diversify our income base and create additional financial surpluses which are used to invest in NHS patient care and our facilities and equipment. In addition, we are establishing Essential Trading, which will allow us to maximise income generation from our capital, estates and facilities expertise going forward. Over the coming years we will continue to develop and / or deliver the following commercial opportunities and joint ventures:

- *A partnership with HCA to run private patient cancer services at Guy's;*
- *Growing our private inpatient, medical and maternity services at St Thomas';…*"[55]

University College London Hospitals NHS Foundation Trust

- Private patient income at University College London Hospitals NHS Foundation Trust (UCLH) has increased by 128% from 2009/10 to 2012/13, generating income of over £20 million in 2012/13.[56]
- UCLH has had a long-standing relationship with HCA which allows a share of private patient revenue to be invested back into the NHS.

1.74 The Foundation Trust's annual report specifically notes: "*HCA International is leasing the fifth floor of the Centre for a dedicated private cancer and haematology centre. This builds on a long-standing partnership between UCLH and HCA which began at University College Hospital in 2006 and allows a share of proceeds to be invested back into the NHS*".[57]

King's College Hospital NHS Foundation Trust

- King's College Hospital (KCH) has identified increased private patient work as a new income stream, taking advantage of the relaxation of the Private Patient Income cap.
- KCH has noted that income diversification is a key strategic opportunity, and it is developing its Private Patient and Commercial services. KCH has identified a need to expand capacity to create additional beds and theatres in order to increase private patient capacity, amongst other things.

1.75 Key passages from the Annual Report(s) include:

1.76 "*Income diversification is a key strategic opportunity, and we are developing our Private Patient and Commercial services*".[58]

1.77 "*The current commercial strategy is framed around a number of discrete sectors where there is considered to be commercial opportunity:*

- *Information systems*
- *Private patients*
- *Outsource services*

[55] Annual Report 2012/13, page 31
[56] See Table A1.1 above.
[57] Annual Report 2012/13, page 33
[58] Annual Plan 2012/13, page 13

- *Overseas opportunities*
- *Other IP development and commercial trials*

It is intended that over the period of this plan KCH Commercial Services will seek to maximise opportunities within these sectors".[59]

1.78 "*To secure the Trust's financial position going forward, the following priorities have been proposed for each of the relevant objectives: [...]*

i. Develop cost improvement and income diversification schemes

- *Maintenance of existing cost controls (e.g. reducing agency staffing)*
- *The design and delivery of focused Cost Improvement Programmes (CIP)*
- *The identification of new income streams including increased private patient work, taking advantage of the relaxation of the Private Patient Income cap*".[60]

1.79 "*The Trust's fundamental objective is to maintain financial stability in a difficult economic climate over the next three years, while delivering positive outcomes to patients…. The Trust needs to expand capacity to create additional beds and theatres in order:*

1. *to meet the increased demand in emergency activity,*
2. *to reduce waiting times and deliver all access targets,*
3. *to accommodate strategic changes in specialist tertiary activity,*
4. *to increase private patient capacity*".[61]

Chelsea & Westminster Hospital NHS Foundation Trust

- Chelsea & Westminster has identified expanding private patient services at the hospital as an opportunity for growth and has indicated that it will expand private work (e.g. bariatrics, plastics and paediatric surgery) in the event of the private patient cap being lifted.

1.80 Key passages from the Annual Report(s) include:

1.81 2011/12 Strategic Approach: "*Grow private patient income if and when the cap on private patient activity is lifted to compensate for activity that may be lost as a result of NHS efficiency savings and our commissioners' demand management initiatives*".[62]

1.82 Principal risks and uncertainties facing the Trust: "*There are also uncertainties with regard to the potential impact of the Government's planned NHS reforms, as set out in the Health and Social Care Bill. Proposed changes that may affect the Trust include the reorganisation of commissioning, the future of the private patient income cap, more choice for patients, and increased competition*".[63]

[59] Annual Plan 2012/13, page 15
[60] Annual Plan 2012/13, page 7
[61] Annual Plan 2012/13, page 12
[62] Annual Report 2010/11, page 11
[63] Annual Report 2010/11, page 47

1.83 "*The possible lifting of the current private patient cap for Foundation Trusts would provide us with an opportunity to increase our income from private patient services".*[64]

1.84 Exploring Opportunities for Growth: "*Grow private patient income through short-term and long-term opportunities, following changes to the cap on private patient activity*".[65]

1.85 Long-term plans: "*The Trust has indicated that it would expand private work (eg bariatrics, plastics and paediatric surgery) if the private patient cap is lifted*".[66]

1.86 Principal risks and uncertainties facing the Trust: "*There are uncertainties with regard to the potential impact of the implementation of the Health and Social Care Act, in particular the transfer of responsibility for commissioning services to GPs, relaxation of the private patient income cap, more choice for patients, and increased competition*".[67]

1.87 "*The increase to the private patient cap may expose the Trust to greater competition for private patient activity although it will also provide the Trust with an opportunity to increase its private patient income*".[68]

1.88 "*We are also looking at opportunities to expand private patient services at the hospital*".[69]

1.89 "*The Trust has indicated that it would expand private work (eg bariatrics, plastics and paediatric surgery) if the private patient cap is lifted. We trust that any concentration on promoting the most profitable services do not have any negative impact on the NHS clinical services the hospital provides*".[70]

1.90 "*Whilst we have made significant progress on our journey to achieve our vision within a changing environment, there are a number of significant internal and external challenges and opportunities that need to be addressed. Therefore our strategic objectives for the next three years have been grouped around three broad areas focusing on specialities, exploiting growth opportunities, and achieving sustainability…… If and when the private patient cap is to be removed, to expand private work through increasing private maternity capacity from 67% to 100% of total physical capacity and market specialist private work in bariatrics, plastics and paediatric surgery*".[71]

1.91 "*Of the £20bn efficiency saving that the NHS has to realise by 2014/15, North West London must identify £1bn and therefore this contracting round for 2011/12 has seen some challenging proposals and negotiations to manage the reduced available funding in the system…..The Trust has recently completed a successful contract negotiation round with the North West London Partnership and the agreed baselines have been factored in to the departmental delivery plans to mitigate any adverse activities against agreed plan. If the private patient cap were lifted this would also help us mitigate the impact of reduced activity by backfilling spare capacity*".[72]

[64] Annual Report 2010/11, page 48
[65] Annual Report 2011/12, page 19
[66] Annual Report 2011/12, page 65 Annual Report 2011/12, page 65
[67] Annual Report 2011/12, page 82
[68] Annual Report 2011/12, page 83
[69] Annual Report 2012/13, page 15
[70] Annual Report 2012/13, page 98
[71] Forward Plan 2012-2014, page 3
[72] Forward Plan 2012-2014, page 8

Royal National Orthopaedic Hospital NHS Trust (RNOH)

- In early 2012, the RNOH entered into a three-year contract with Spire Healthcare to run the PPU at its Stanmore site in London – to improve existing private patient services and drive up revenue. This followed a tendering exercise in late 2011 during which an initial scoping exercise pointed to potentially significant uplifts in private patient revenue being achievable.[73]

- In December 2012, the RNOH submitted a planning application to transform the site to meet the needs of patients in the 21st century. Among other capital expenditure, the proposal includes plans for a new PPU.

Barts Health NHS Trust

1.92 While Barts Health NHS Trust did not make any *specific* mention of private patients strategies in its annual reports over the last three years, the Trust is in the process of a billion pound construction and redevelopment programme, which will create two new "state-of-the-art" hospitals.[74] Barts will host a new state-of-the-art cancer and cardiac centre and the Royal London Hospital will provide a specialist women and children's centre.[75]

[73] See Health Service Journal (HSJ), 26 April 2012.
[74] http://www.skanska.co.uk/Global/Sevices/Building-Central-Regions/Barts-and-The-London-Project-Sheet.pdf
[75] http://www.skanska.co.uk/Projects/Project/?pid=2311&plang=en-gb

2. APPENDIX 2: SELF-PAY PRICE CONCENTRATION ANALYSIS (PCA)

(1) SUMMARY

2.1 In order to carry out a quantitative assessment of the effects of local concentration on prices paid by self-pay patients, the CC undertook a regression analysis of the data provided by the hospital operators. This exercise, often referred to as Price-Concentration Analysis (PCA), seeks to evaluate the relationship between price and concentration, while controlling for other factors.

2.2 The remainder of this Appendix sets out HCA's detailed views on the PCA presented by the CC in its PFs. A summary of HCA's arguments is in section 5 of this Response.

2.3 The CC presented the results from an earlier version of its PCA first in its AIS[76] and subsequently in a Working Paper that dealt specifically with the PCA.[77] HCA critiqued these analyses in two separate submissions.[78] This Appendix should be read alongside these submissions.

2.4 This Appendix proceeds as follows:

- First, it summarises the methodology and main findings from the PCA, as set out by the CC;
- Next, it discusses why the effect of local market concentration on self-pay prices as identified by the CC is at best very weak, both statistically and in terms of the estimated magnitude of the effect;
- Further, it sets out a number of methodological issues with the CC's PCA that in HCA's view fundamentally undermine its relevance to HCA. In particular:
    - it challenges the complete omission of data for PPUs and independent hospitals from the analysis, affecting concentration figures and limiting the sample size (in a biased way). The CC acknowledged that its PCA was carried out in spite of 55% of invoices missing in London;[79]
    - it sets out major concerns in relation to how inadequately the PCA controlled for key factors such as (episode) quality (including technology differences), complexity (including co-morbidities and expectation of complications) and costs; and
    - it sets out further serious methodological concerns that HCA has with the CC's analysis (including issues around the use of Logit Competition Index (LOCI), issues with the CC's use of instrumental variables and the inadequacy of how

[76] See AIS, Appendix B, Annex 3.
[77] CC, Working Paper: Price concentration analysis for self-pay patients.
[78] See HCA's Response to Competition Commission's Annotated Issues Statement; and HCA's Response to CC in relation to Data Room exercise and the CC's Working Paper: Price concentration analysis for self-pay patients.
[79] The CC also recognised that this was *"because of the higher number of [independent hospitals] and PPUs in London"* (Appendix 6.9 to PFs, para. 18).

the CC controlled for the competitive constraint from the NHS and for other "demand-side" factors).

- Then before concluding, it explains why the results from the CC's own PCA have no bearing on private healthcare provision in London or on HCA. The PCA only considers four focal treatments (which are only relevant to three out of the 17 specialties considered by the CC in its inquiry). These treatments are not representative of HCA's business, accounting for [✂] of UK self-pay inpatient episodes (or [✂] of HCA's UK self-pay inpatient revenues) between 2009 and 2012.

2.5 HCA is concerned that the CC relied on a novel index such as LOCI (which is inappropriate for this market and has hardly received any attention or scrutiny by either academic economists or competition authorities) and that it used LOCI in a mechanistic way, e.g. as a filter to identify "hospitals of potential concern". This, combined with the facts that

- even when some of HCA's hospitals were identified as being of potential concern, this was only very marginally so by the CC's own threshold used[80];
- no HCA hospital has been identified as being of potential concern under any of three out of the four formulations of the index (LOCI) considered by the CC[81]; and
- the CC omitted from the analysis of competitive constraints in London a large set of HCA's competitors simply because it did not have the data,

casts severe doubts on the CC's assessment of local competitive constrains, even beyond the PCA itself.

2.6 The fact that the CC had to inform HCA several times of changes in the set of HCA's hospitals identified as being of potential concern over the course of the inquiry (including, in the case of [✂], *two months after publishing its PFs*) is a strong indication of the very high degree of uncertainty and lack of robustness in the CC's analysis.

2.7 The difficulties in performing a robust analysis that only relies on measures such as market concentration and prices also clearly highlight how crucial it is for the CC to fully consider the role of quality and innovation in the competitive process characterising the supply of private healthcare in the UK.

2.8 In sum, the weaknesses in the CC's PCA are so severe that this analysis cannot constitute evidence supporting the CC's provisional finding of an AEC due to *"weak competitive constraints in [a local market such as] central London"*.[82] Moreover, even if the CC persisted in using the evidence from its PCA for an assessment of competitive constraints in the supply of private healthcare in the UK (which HCA believes the CC should not), HCA firmly submits that any conclusion on the competitive outcomes *in central London* that was based on the CC's PCA would be fundamentally misplaced.

2.9 As a result of these considerations, any divestment remedy imposed on HCA based on an analysis that has no relevance to London would be fundamentally flawed.

[80] See HCA's Response to CC in relation to Data Room exercise and the CC's Working Paper: Price concentration analysis for self-pay patients, paras. 4.18–4.23.
[81] *Ibid.*
[82] PFs, para. 72.

(2) A SUMMARY OF HOW THE CC'S PCA CHANGED OVER THE COURSE OF THE INQUIRY

2.10 The aim of any PCA is to investigate the extent of any relationship between local market concentration and prices. In its PFs, the CC wrote:

> *"The hypothesis that we have tested is that hospital operators are currently able to levy higher self-pay prices in local areas where they face fewer competitive constraints. If this hypothesis holds, then all else equal, higher self-pay prices are expected in such areas. It would also imply that self-pay prices may be reduced if more competition were present in certain local areas."* [83]

2.11 The CC published its Working Paper on the self-pay PCA in March 2013. This Working Paper focused on eight treatments,[84] using a mix of hospital operators' and Healthcode data for the main variables, with reference to the 2009–2012 period, and controlled for a number of further variables.[85] The CC used insured (as opposed to self-pay) LOCI as the main explanatory variable (seeking to capture local market concentration), while the prices in the analysis referred to self-pay episodes. In separate model specifications, the CC used fascia counts as the main explanatory variable.

2.12 The CC relied on an OLS model, and found that (insured) LOCI had a statistically significant effect on self-pay prices, while a different proxy for local market concentration (fascia counts) did not have a statistically significant effect on self-pay prices. The CC ran separate estimations using two possible instrumental variables to corroborate its view that the OLS specification was econometrically sound for the purpose of the self-pay PCA.

2.13 Using its preferred OLS model specification, in the Working Paper, the CC concluded that a 20 percentage point increase in the weighted average market share by a given hospital is associated, all else equal, with an increase of 3.6% in the self-pay price for a treatment. The CC carried out a number of robustness checks, some of which suggested that the relationship between local market concentration and self-pay prices may not hold for all operators or for all treatments.

2.14 The CC published a revised PCA as part of its PFs on 2 September 2013 (Appendix 6.9). There were a number of important differences with respect to the PCA presented in the Working Paper. In particular, the CC:

- Dropped from the analysis four of the eight focal treatments previously considered;[86]
- Used self-pay LOCI instead of insured LOCI as the main explanatory variable (thereby focusing its entire analysis only on the main five hospital networks in the UK);
- Added a number of control variables to the analysis, such as some local area characteristics (including average NHS waiting times) and whether a hospital provides critical care level 3 (CCL3) facilities;
- Used a more aggregated location "dummy" variable in its preferred specification (NUTS-1 level controls instead of NUTS-2); and

[83] Appendix 6.9 to PFs, para. 3.
[84] Gastric banding, hip replacement, inguinal hernia surgery, knee replacement, prostate resection, removal of gallbladder and rhinoplasty following trauma.
[85] HCA's Response to CC in relation to Data Room exercise and the CC's Working Paper: Price concentration analysis for self-pay patients.
[86] The PCA in Appendix 6.9 to PFs therefore considered only: gallbladder removal, hip replacement, knee replacement and prostate resection.

- Considered three instrumental variables (IVs) and preferred its IV specification over the OLS one.[87]

2.15 In its PFs, the CC summarised the results of its PCA as follows:

"The results of this analysis show that there is a relationship between self-pay prices and local concentration and imply that, all else equal, self-pay prices are higher in more concentrated local areas [...] Our preferred estimate[s] [...] imply that increases in LOCI of around 0.2 are expected, on average, to lead to reductions in self-pay prices of around 3 per cent. The preferred fascia count model [...] impl[ies] a similar relationship, suggesting that one additional fascia located within 9 miles may be expected to lead to, on average, lower self-pay prices by around 4 per cent." [88]

2.16 HCA fundamentally disagrees with these conclusions and their relevance to London. The reasons for this are set out in the following sections.

2.17 HCA's advisers also note that, following the identification of errors the CC identified in its cleaning of the Healthcode dataset, the CC further amended its PCA (without publishing an updated version of Appendix 6.9) and only provided the parties' advisers with electronic versions of the updated results in the Data Room that started on 28 October 2013.

(3) THE RESULTS OBTAINED BY THE CC ARE NOT ROBUST AND LACK ECONOMIC SIGNIFICANCE

2.18 Notwithstanding HCA's concerns that (i) the PCA is fraught with methodological issues (see paragraphs 2.24-2.86 below), and that (ii) the PCA is irrelevant for private healthcare provision in London (see paragraphs 2.87-2.96 below), the PCA's aggregate results for the UK as a whole identify – at best – a very weak relationship in statistical and economic terms, as set out in the next paragraphs.

2.19 In the PCA presented in the AIS and in the Working Paper, the CC relied upon OLS estimation. Applying the same OLS methodology to the PCA presented in its PFs, the CC found that the coefficients of interest on the key explanatory variable are not statistically significant in five out of six of the specifications presented (in the sixth specification, that coefficient is only statistically significant at the 10% level). Put otherwise, in statistical terms, the effect of local market concentration (whether proxied by LOCI or by fascia counts) on the self-pay prices of the four treatments that the CC focused on cannot be distinguished from zero, in five out of six specifications of the model.

2.20 In the PCA presented in its PF, the CC preferred IV estimation (HCA provides a critique of this in paragraphs 2.69-2.77 below).[89] Using this estimation, the CC found a statistically significant effect of local market concentration (as proxied by LOCI or fascia counts) on self-pay prices. Its preferred model specification using LOCI as a proxy for local market concentration (model L7) suggests that a 20 percentage point fall in LOCI (which the CC interprets as a 20 percentage point increase in weighted average market share of a given hospital) is associated with about a 3% price rise for a self-pay treatment, keeping all else equal. Its preferred model specification using fascia counts as a proxy for local market concentration (model FC7) suggests that adding one competing hospital within a 9-mile radius of a hospital is associated with about a 4% price reduction for a self-pay treatment, all else equal.

[87] Appendix 6.9 to PFs, para. 63.
[88] Appendix 6.9 to PFs, paras. 106–107.
[89] Appendix 6.9 to PFs, para. 63.

2.21 HCA submits that the order of magnitude of these estimates is immaterial. That is, even if the IV specification found effects that may be statistically significant, they are not *economically* significant. A hypothetical 20 percentage point change in weighted average market share (which the CC thinks corresponds to a 0.20 change in LOCI) is a substantial change in market structure. And yet a hospital whose market share *exogenously* increased from 35% to 55% (i.e. keeping all else equal, including quality) would only be able to increase its self-pay prices by 3%, according to the CC's analysis.

2.22 The lack of economic significance of the estimated coefficient can also be appreciated by considering the following (extreme) example. Consider a very small firm in the market, with a market share close to 0% and suppose that this firm then acquires (for whatever reason) a market share of 100%: even in this unrealistic scenario, which the CC itself considers *"extreme [and] ever unlikely to occur in practice"*,[90] the CC's PCA would predict that this firm would only be able to increase its self-pay prices by 15%.

2.23 In other words, no meaningful economic relationship is established, especially when considering the lack of robustness in the CC's methodology, particularly around the failure to properly control for quality and costs (discussed in the next section).

(4) THE CC'S PCA SUFFERS FROM A NUMBER OF METHODOLOGICAL ISSUES

The CC's analysis does not consider PPUs and independent hospitals, thus missing over 50% of relevant invoices in London

2.24 As HCA set out in a number of its submissions,[91] as well as in section 5 of this response, PPUs play a major, and growing, competitive role in London. Likewise, independent hospitals such as the London Clinic, the Bupa Cromwell Hospital, the St. John and St. Elizabeth, King Edward VII, BMI London Independent and Aspen Parkside add further competitive constraints on HCA. The CC's PCA has *entirely* ignored all of these competitive constraints, purely on the basis that data from these hospitals was not available.

2.25 HCA notes that a meaningful analysis of competitive constraints cannot be driven purely by practical considerations, such as data availability. The CC itself acknowledged that its PCA was carried out in spite of 55% of invoices missing for the computation of self-pay LOCI in London. The CC recognised that this was:

"because of the higher number of [independent hospitals] and PPUs in London"[92]

2.26 HCA submits that this fact alone should prevent the CC from drawing any inferences from its PCA on any aspect of private healthcare provision in London.

2.27 This very serious omission implies that:

- Self-pay LOCI calculations are heavily downwardly biased (i.e. the CC overestimated the weighted market shares of the operators for which it did have data);
- The sample size is much smaller than it should be; and

[90] Appendix 6.9 to PFs, para. 30.
[91] See, for example, HCA's Response to AIS; and HCA's Response to CC in relation to Data Room exercise and the CC's Working Paper: Price concentration analysis for self-pay patients.
[92] Appendix 6.9 to PFs, para. 18.

- Major competitive constraints in London from independent hospitals and PPUs excluded from the analysis.

2.28 This is further evidence that the CC's PCA cannot be relied upon, especially insofar as private healthcare provision in London is concerned. It would be completely wrong (and almost circular) for the CC to use any evidence from its PCA (as presented in its PFs) as the basis for an AEC due to *"weak competitive constraints in [a local market such as] central London"*. It is difficult to see how the CC could test for competitive constraints in London when its PCA simply omitted data from a large range of competitors to HCA.

The CC's analysis lacks suitable controls for episode quality, complexity and costs

2.29 The CC wrote:

"Our analysis has sought to evaluate the relationship between price and concentration [...] while accounting for other factors so that a like-for-like comparison is achieved." [93]

2.30 While achieving a like-for-like comparison should be one of the main requirements of a robust PCA, the CC's own analysis failed to deliver on this front. This is true for a range of factors that need to be controlled for. Specifically, the CC failed to properly control for a range of factors, including heterogeneity across operators, across areas, across patients and across episodes.

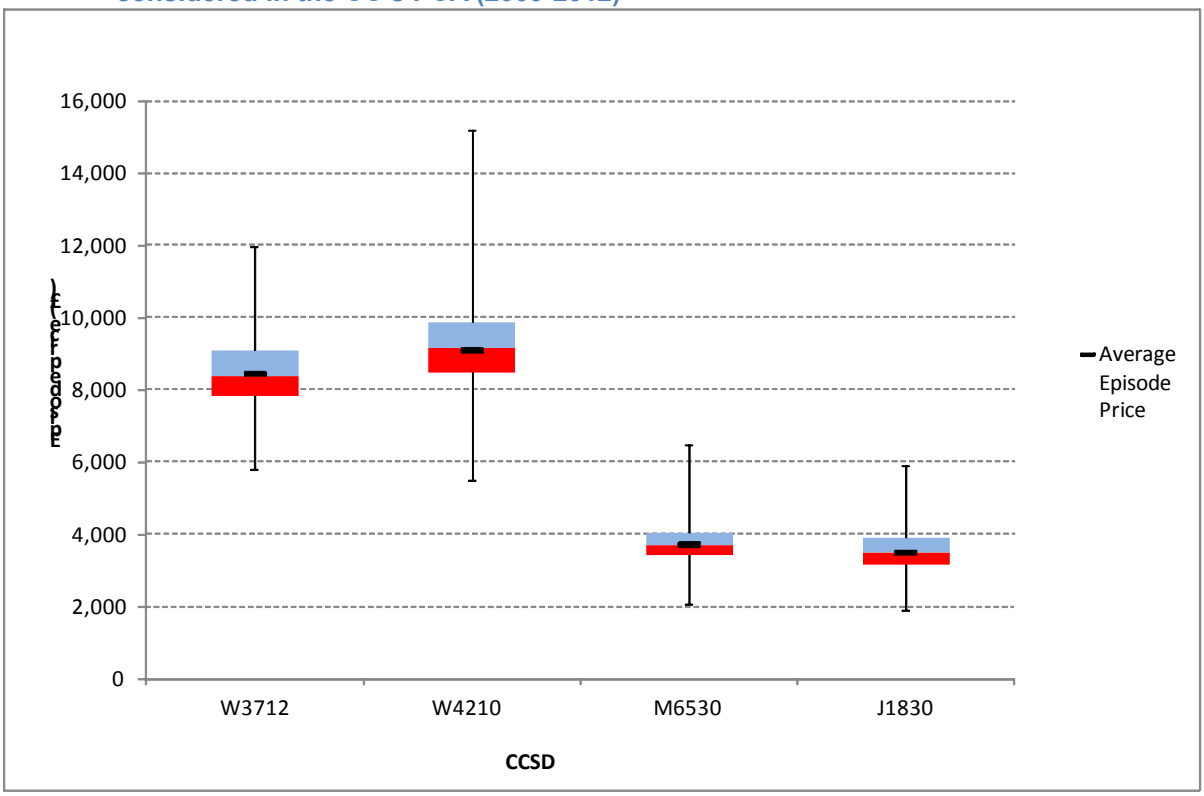
2.31 In this section, HCA focuses on three drivers of heterogeneity that the CC's analysis has failed to properly capture: differences in episodes' quality (including technology differences), complexity (including co-morbidities and expectation of complications) and costs.

2.32 The CC identified significant price variation in the data used for its PCA.[94] This is not surprising, given the number of factors affecting prices in this market leading to the sources of heterogeneity just mentioned. For instance, the cost of implants for hip and knee replacements is extremely variable. In addition, there is often more than one technology available to perform certain treatments, with related changes in the price charged to patients.[95]

2.33 Figure A2.1 below is a box-and-whisker plot which clearly shows the very high degree of price dispersion characterising the four focal treatments identified by the CC.

[93] Appendix 6.9 to PFs, para. 1, emphasis added.
[94] Appendix 6.9 to PFs, para. 11.
[95] For instance, both prostate resection and removal of gallbladder can be carried out with minimally invasive procedures or with open surgery.

Figure A2.1: Box-and-whisker plot of episode prices for the four focal treatments considered in the CC's PCA (2009-2012)



Source: Analysis by HCA's advisers of the PCA data available in the Data Room.
Notes: (1) The four treatments considered in the graph are: ***Gallbladder removal (J1830)****,* ***Prostate resection (M6530), Hip replacement (W3712) and Knee replacement (W4210)****; (2) This figure plots, from the bottom to the top of each item, the following summary statistics (for each focal treatment): minimum value, 25th percentile, median, 75th percentile and maximum (the average value is marked separately with a dash); (3) The data considered in the Figure excludes the treatments which the CC considered "irregular".*

2.34 The CC also stated:

"For any unaccounted issues to potentially distort our analysis, the differences would have to affect the data in a way that is correlated with both price and concentration. We have not heard arguments or received evidence to suggest that this may be the case." [96]

2.35 This is simply wrong. The CC *has* heard arguments and *has* received evidence that there are unobserved differences across operators which are correlated with both price and concentration.[97]

2.36 A major omission in the CC's PCA is a control for quality of treatment received (or at least quality of the hospital operator, which cannot be simply captured by a dummy variable). One would expect quality to be positively correlated with self-pay prices *and* negatively correlated with the CC's measures of market concentration (LOCI).

2.37 Put simply, in an environment where patients value quality, high-quality providers are likely to be *both* more successful in the marketplace (resulting in a higher market share and lower

[96] Appendix 6.9 to PFs, para. 13.
[97] HCA's Response to CC in relation to Data Room exercise and the CC's Working Paper: Price concentration analysis for self-pay patients, paras 5.25–5.33.

LOCI than otherwise) *and* to be able to charge prices that reflect their quality (and cost) of private healthcare provision.

2.38 The empirical academic literature in industrial organisation has established that demand models that do not account for unmeasured product or service quality are inadequate.[98] This literature provides both theoretical and empirical support (using data from many different market settings) for the conclusion that, in a private healthcare context, a hospital that provides high-quality treatments, something which is not measured in the CC's dataset, may be expected to have a higher market share (because quality is important in the choice of where patients are treated) and may be able to charge higher prices (because it is costly to provide high-quality healthcare).

2.39 Because unmeasured quality is likely to be positively correlated with price and negatively correlated with LOCI, the OLS results are likely to *overestimate* the impact of LOCI on price. The true coefficient is likely to be closer to zero.[99] Concentration and prices are *jointly* determined, by one or more factors (discussed in part (4) of this appendix) which the CC has not controlled for. Thus the CC failed to identify a "causal" relationship between local market concentration (proxied by LOCI) and self-pay prices. Concentration is therefore endogenous in the CC's PCA. The CC suggested its IV specification addresses such potential endogeneity concerns.[100] HCA disagrees for a number of reasons, set out at paragraphs 2.69–2.77.

2.40 In addition to differences in quality, the PCA failed to recognise episode heterogeneity in terms of complexity.

2.41 The CC considered that whether a hospital site had CCL3 facilities is a control for *"differences associated with hospitals providing this level of care (e.g. as a result of perceived or actual differences in quality of service, or case mix)"*.[101] However, considering CCL3 facilities is not an appropriate way of accounting for quality in this analysis. Quality varies according to a number of factors, which cannot be captured by considering CCL3 facilities (see paragraph 2.49).

2.42 HCA already set out in its Response to the AIS[102] a number of factors which can affect the complexity of an individual patient's treatment:

- "*The existence of co-morbidities (i.e. existing unrelated conditions) such as diabetes and respiratory disease which increases the complexity of treatment.*
- *The need for HDU or ICU support.*

[98] See Berry, Levinsohn and Pakes (1995), Nevo (2000), Berry, Levinsohn and Pakes (2005), and Davis and Garcés (2009).
[99] If the true reduced-form model was y = a*x + b*z + ε, with y representing price, x capturing local market concentration, z representing (omitted) quality and ε being the error term, then the OLS estimate of the parameter of interest (i.e. a) in a model with omitted quality as the one estimated by the CC would be equal to a + b* E(z|x). Suppose E(z|x) = d, then the OLS estimate of a equals a+b*d. One may reasonably expect b to be positive (i.e. quality has a positive effect on price) and d to be negative (a higher LOCI, i.e. a lower weighted average market share, is associated with lower quality). Therefore, as a result of omitted quality, the estimated coefficient associated to LOCI will be larger in absolute terms, leading to an overestimate of the true effect of concentration on prices.
[100] Appendix 6.9 to PFs, para. 63.
[101] Appendix 6.9 to PFs, para. 33(f).
[102] See para. 4.48.

- *Type of prosthesis which will depend on lifestyle and how active a patient wants to be afterwards and which can have a significant impact on price.*
- *Whether there has been previous surgery, e.g. surgery on patients with a previous history will be more complicated and require more clinical input.*
- *Patients transferred into HCA hospitals from other facilities (i.e. "transfers-in") will have higher clinical requirements and may have special nutritional needs or have infections.*
- *Disease process e.g. the same surgery could be carried out for malignant or non-malignant disease but might require additional pathology, imaging, etc.*
- *For patients with cancer, personalised chemotherapy regimens."*

2.43 Moreover, HCA's Acute Admission's Unit and Urgent Care Centre allow for more complicated patient admissions to their hospitals e.g. acute gall bladder removal, hip replacement from a fall, with corresponding higher prices.

2.44 Further, HCA already submitted to the CC some case studies of patient episodes demonstrating the extent to which the requirements of a patient undergoing the same treatment can differ, with large resulting differences in the episode prices charged.[103] HCA sets out further reasons as to why there may be significant differences across episode prices in Appendix 4 in the context of HCA's critique of the CC's insured price analysis.

2.45 As for the use of heterogeneity and measurement of costs, the CC wrote:

"On the supply side, the parties have argued that our cost variable is measured with significant error [...] We agree that a disaggregated cost measure would be preferable if it were to be available (it is not), but we consider that in conjunction with the CCL3 dummy and regional dummy variables, the three variables are sufficient to account for the salient cost differences between hospitals. [...]" [104]

2.46 Once again, the CC's analysis was driven by practical considerations, rather than by best practice. The PCA completely failed to account for heterogeneity across episode costs (which are likely to be correlated to episode complexity, as shown, for example, in case studies presented by HCA).[105]

2.47 For instance, the cost of providing hip replacements and knee replacements will depend on a number of factors, which are likely to drive significant differences in costs.[106] Similarly, different technologies are available to implement certain procedures. As an example, both prostate resection and removal of gallbladder can be implemented with minimally invasive procedures as opposed to open surgery, with significant cost implications.

2.48 These issues, together with the case studies already provided to the CC,[107] provide evidence that the CCL3 dummy and regional dummies are not sufficient to account for salient cost differences. Further evidence that the CC's measures of costs are insufficient comes from

[103] HCA's Response to CC in relation to Data Room exercise and the CC's Working Paper: Price concentration analysis for self-pay patients, Annex 1.
[104] Appendix 6.9 to PFs, para. 50.
[105] HCA's Response to CC in relation to Data Room exercise and the CC's Working Paper: Price concentration analysis for self-pay patients, Annex 1.
[106] For example, both procedures are characterised by significant variability in implant cost.
[107] HCA's Response to CC in relation to Data Room exercise and the CC's Working Paper: Price concentration analysis for self-pay patients, Annex 1.

the fact that the CC measures are not statistically significant drivers of price across any of the CC's four baseline specifications. If the CC's measures of costs were adequate, then the CC should find a statistically significant relationship between price and cost. Regardless of the level of competition in an industry, pricing decisions should be affected by costs. Finding no relationship between the cost measures and prices suggests that the variables used by the CC are not adequate measures of cost.

2.49 Quality differentials are likely to drive price differentials across hospitals in a number of ways that the CC's analysis failed to take into account. For instance, as discussed in more detail in Appendix 4, HCA incurs higher costs to provide higher quality for a number of reasons, including:

- HCA needs to employ highly qualified staff for highly complex procedures;
- HCA employs more Resident Medical Officers (RMOs) than other private hospital operators;
- HCA employs more Clinical Nurse Specialists (CNSs) than other private hospital operators;
- HCA has a high ratio of nurses to patients than other private hospital operators in order to ensure the highest quality care;
- In the provision of CCL3 beds, HCA incurs higher costs, not only associated with the initial investment but also the ongoing clinical staff costs;
- HCA has more operating theatre capacity which gives rise to greater theatre maintenance and operational costs; and
- The operation of more sophisticated treatment technology requires highly trained staff to safely operate the equipment and assist the consultant to administer treatment.

2.50 Without considering the costs differences that arise from these various quality differentiators the CC's analysis cannot be seen as a reliable measure of the relationship between concentration and prices in London.

2.51 Finally, the CC controlled for the presence of CCL3 facilities at a hospital site level. However, while this variable captures part of the price variation at hospital level, it does not control for *episode* complexity (i.e. whether *that* episode required such care), which is a key driver of episode cost and therefore episode price. Typically, only a small proportion of HCA self-pay patients for the four treatments chosen by the CC end up requiring CCL3. Since 2012, [✂] prostate resection episodes at HCA have required CCL3, whilst [✂] of gallbladder removals have required CCL3 along with [✂] of both hip and knee replacements.

LOCI is not appropriate either as an explanatory variable in the PCA or as a measure of local market concentration

2.52 The use of LOCI as the explanatory variable by the CC raises concern for two reasons; first, due to theoretical issues surrounding the measure itself and, second, due to the practical way in which it has been applied by the CC.

2.53 As HCA already submitted, LOCI has received virtually no academic scrutiny. The original paper on LOCI is only an unpublished manuscript from 2006.[108] The CC pointed out that this reference also features in the Handbook of Healthcare Economics. However HCA notes that such Handbook reviews typically cite ongoing research and manuscripts to flag interesting or topical areas of research. This cannot be taken as a substitute for peer-reviewed publication and proper academic scrutiny. This measure has hardly ever been used in competition policy enforcement either. HCA submits that the CC should be particularly cautious before reaching any conclusions about the nature and extent of competition in a market based on such a novel and untested measure, especially if the CC were to rely on this to justify draconian remedies such as divestments.

2.54 The theoretical support for the LOCI measure rests on a particular economic model (logit) which the empirical academic literature has widely criticised for implying extreme and counterintuitive substitution patterns.[109] LOCI therefore suffers from the same methodological pitfalls as the logit model on which it is based.

2.55 As is the case for all market share-based measures, LOCI is not a substitute for market definition. Indeed, the implementation of LOCI requires that both the product and the geographic market are defined in advance, rather than being determined by the data. For instance, the CC defined the product market as the 16 medical specialities plus oncology in order to apply LOCI.

2.56 In addition, there are a number of issues with the way in which the CC has applied LOCI. HCA notes that the CC has been inconsistent with its interpretation of LOCI. In its PFs, the CC wrote:

"the hypothesis that we have tested is that hospital operators are currently able to levy higher self-pay prices in local areas where they face fewer competitive constraints." [110]

2.57 This is not the hypothesis that the CC tested. The hypothesis that the CC actually tested is whether prices are higher when a weighted average market share is higher (or LOCI is lower). That is, the CC implicitly assumed that LOCI could be used as a proxy for market power, whereas in the discussion of LOCI in its PFs it made clear that it should just be interpreted in a mechanistic way to compute a weighted average market share.[111] This is an important distinction, as the CC has not established that LOCI or other measures based on market shares are a good indicator of (local) market power. Here the CC is simply assuming that this is the case.

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[108] Y O D Akosa Antwi, M Gaynor & W B Vogt, "A competition index for differentiated products oligopoly with an application to hospital markets", unpublished manuscript, 2006.

[109] See, for example, Davis and Garcés (2009) and the chapter by Margaret Slade on "Merger simulations of unilateral effects: What can we learn from the UK brewing industry" in Bruce Lyons, "Cases in European competition policy" (2009).

[110] Appendix 6.9 to PFs, para. 3

[111] *"Reformulating the equation for the LOCI, we see that it is in fact equal to one minus a weighted-average market share [...] Interpreted in this way, rather than as the result of a particular economic model, we consider the LOCI measure to have intuitive and economic appeal"* (PFs, Appendix 6.4, para. 8).

2.58 More generally, HCA submits that:

- The LOCI variable is endogenous in the regression model specified by the CC;
- LOCI as implemented by the CC is downwardly biased (i.e. the level of concentration is overestimated);
- LOCI as implemented by the CC is measured with error resulting in unknown bias in the estimated relationship;[112]
- LOCI as implemented by the CC does not conform with the assumptions required for a logit model; and
- The way in which the CC computed network LOCI is inconsistent with the CC's own use of that measure in the PCA.

2.59 Each of the first three factors alone is sufficient to make the PCA's results unreliable and certainly prevent any "causal" interpretation of the coefficients estimated by the PCA. As discussed in the next section, the instrumental variables used by the CC did not solve this issue.

2.60 LOCI is endogenous for the reasons set out above. This is caused by the CC's failure to properly control for quality, complexity and costs, which jointly determine market performance (e.g. market share) and prices.[113]

2.61 LOCI is also underestimated (that is, the weighted market shares – using the CC's interpretation of LOCI – of the hospitals considered in the analysis are overestimated) because PPUs, independent hospitals and NHS hospitals are excluded from the CC's analysis. The resulting measurement error is likely to be correlated with local market factors like quality, cost and demographics that all are related to market performance, to cost and to prices, thus possibly inducing a bias in the estimation of the coefficient associated to LOCI in the PCA.

2.62 Further, LOCI is measured with error (over and above the serious omission just set out) due to a number of inconsistencies in how hospitals record their episodes, as HCA already explained.[114]

2.63 The LOCI measure also presupposes the presence of a baseline option, but the CC failed to consider this appropriately in its analysis.[115] In particular, the CC's calculation assumes the market share of the baseline option is zero, which is unrealistic, thus resulting in a LOCI that is too low and therefore measured with error.

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[112] Note: this is not classic "measurement error" or white noise. So, it should not necessarily be expected to have a downward bias on the LOCI coefficient.

[113] It is reasonable to argue that hospitals that deal with on average more complex cases on average have higher shares and so lower LOCI because they can cater to a wider range of customers. Offering a wide range of specialty care is costly and valued by consumers and is not picked up by the dummies in the CC regressions. Hence it is an omitted variable that is correlated with high prices, high market shares and low LOCI.

[114] HCA's Response to the AIS; and HCA's Response to CC in relation to Data Room exercise and the CC's Working Paper: Price concentration analysis for self-pay patients.

[115] The baseline (or outside) option in a logit model is the alternative the decision-maker ends up with if s/he does not select any of the available alternatives. In this setting, the baseline option would be the alternative available to a patient who decides not to be treated in any of the five hospital groups considered in the analysis.

2.64 For LOCI to be justified as an accurate proxy for market power under the logit model, economic theory requires patient homogeneity within submarkets (i.e. at postcode level, not at NUTS-2 or NUTS-3 area level, according to the CC's analysis). In this case, and only in this case, the weighted sum of market shares is inversely proportional to price-cost margins. This is an extreme conclusion not based on evidence but derived from the logit model. Otherwise, LOCI fails to capture the fact that different patients within a submarket in general will respond in different ways to the set of prices and qualities offered by their local hospitals. For example, higher income patients within a submarket are likely to be willing to pay higher prices, all else equal.

2.65 However, the CC's analysis is flawed because of heterogeneity within a submarket, contrary to the LOCI's requirements. For example, there is heterogeneity in travel distance to the same hospital for patients located in different areas within a postcode. The same holds for age, income and many other demand characteristics. Distance, age and income are key determinants of patients demand for healthcare. From an economic perspective, submarkets should be defined based on homogeneity across all these demand dimensions, among others. Submarkets should not be defined on the ready availability or practical convenience of data at postcode level.

2.66 The CC did not justify how it chose to compute network LOCI with any economic model nor with any intuition. The choice is not even consistent with the demand model detailed in the original unpublished manuscript Akosa Antwi et al (2006).[116] The manuscript provides a formula to calculate a network LOCI in a logit model in an internally consistent way. The formula in the manuscript accounts for the own-price elasticities of each hospital, the cross-price elasticities with respect to each hospital and the overall market shares of each hospital. By contrast, the CC measure of network LOCI ignores these economic considerations and provides no justification for doing so. If one justifies LOCI based on the logit model, then the CC's network LOCI proxy contains a measurement error of unknown sign and magnitude. Even more importantly, if the logit model is wrong (as HCA argues), the relationship between the CC's network LOCI and market power is undetermined.

2.67 The CC argued that it is important to take into account local heterogeneity, arguing in favour of LOCI.[117] Yet the network LOCI measure used undermines that argument because it does not take into account heterogeneity. It treats multiple hospitals owned by the same operator as identical even though they are in different locations and offer different mixes of services. A network LOCI measure that meets the heterogeneity requirements recognised by the CC should reflect quality characteristics of the hospitals and heterogeneity in location and services offered. These factors should affect how consumers substitute across hospitals as discussed in the previous paragraph. Therefore, from a theoretical perspective, a PCA that uses the network LOCI measure as computed by the CC contains omitted variables.

2.68 In summary, the CC's use of LOCI as the explanatory variable raises concerns due to theoretical problems with the index itself and due to the way in which it has been applied by the CC. LOCI is not an appropriate measure for concentration and, as a consequence, the result of the PCA based on such measure should not be considered reliable, for a number of key reasons including:

[116] Y O D Akosa Antwi, M Gaynor & W B Vogt, "A competition index for differentiated products oligopoly with an application to hospital markets", unpublished manuscript, 2006.
[117] Appendix A6.4 to PFs, paras. 13ff.

- LOCI relies on an econometric model (logit), which is widely criticised in the literature for producing unrealistic substitution patterns. Also, LOCI, as constructed by the CC, does not conform with the assumptions required by such underlying economic model;
- LOCI has been computed without taking into account a large number of HCA's competitors;
- the relationship between LOCI and prices is affected by factors that are not appropriately controlled for in the CC's PCA. For this reason, the estimated coefficient is likely to be biased; and
- LOCI lacks virtually any academic scrutiny (or any significant practical implementation by competition authorities).

The instrumental variables considered by the CC are not appropriate

2.69 In its PFs, the CC listed the following three conditions that instrumental variables must satisfy:

> *"(a) the instruments should be correlated with the potentially endogenous variable (LOCI in the baseline specification) – instruments that meet this condition are said to be 'relevant';*
>
> *(b) the instruments should be uncorrelated with the unobserved term in Equation 1– instruments that meet the second condition are said to be 'exogenous'; and*
>
> *(c) the instruments should themselves be excluded from the covariates in the price equation – instruments that meet this condition are said to be 'excluded'."* [118]

2.70 HCA disagrees with the choice of instrumental variables used by the CC. This is because all three instruments selected are either likely to be correlated with the unobserved term or likely to enter the main price equation violating conditions (a) and (c).

2.71 First, consider the two instruments that measure distance to a rival hospital and distance to the nearest hospital under common ownership. The CC argues that these instruments are excluded from the primary equation because the network LOCI measure already accounts for the effects of geographic competition.

2.72 However, this argument is wrong. The self-pay prices set by hospitals should depend on the elasticity of demand and (except in the very special case of the logit model) this elasticity should depend not only on the weighted sum of market shares but also on the quality and location characteristics of all the competing products in the market. LOCI is not a sufficient measure of market power as the CC acknowledges in its provisional findings; it is only a proxy of weighted average market shares.[119]

2.73 This conclusion is supported by nearly all the empirical academic literature in industrial organisation on logit demand models. This literature has established that substitution patterns and demand elasticities depend not only on market shares but also on the characteristics of competing products in the market.[120] When the price of a treatment at one hospital increases, patients are not likely to switch simply according to the market share of

[118] Appendix 6.9 to PFs, para. 51.
[119] Appendix 6.4 to PFs, para. 19.
[120] See Berry, Levinsohn and Pakes (1995), Nevo (2000), Berry, Levinsohn and Pakes (2005), and Davis and Garcés (2009).

other hospitals. They will select an alternative option based on a number of factors which LOCI alone cannot fully capture.

2.74 So, from a theoretical perspective, neither distance to a rival hospital nor distance to a hospital under common ownership is a valid instrument. Neither satisfies condition (c).

2.75 Put otherwise, in relation to the instrument that captures the distance to the nearest common-ownership hospital, this must feature in the main pricing equation on the basis of the CC's own thinking, as set out in paragraph 2.67 above. Take two hospitals, Hospital 1 and Hospital 2, located relatively close to each other and owned by the same operator. Given the CC's use of network LOCI, the CC must accept the notion that the price charged for a treatment at Hospital 1 also depends on the distance of Hospital 2 from Hospital 1, which is correlated with a patient's distance to Hospital 1 and thus his or her willingness to pay for a treatment there. This means that the CC's choice of the instrumental variable is flawed.

2.76 HCA notes that the CC also dismisses the use of distance to a hospital under common ownership as an instrument based on its calculation that it is not correlated with the exogenous variable i.e. does not satisfy condition (a).[121] Despite its own dismissal of this instrument, this instrument is still included as one of the two instruments used in the CC's preferred specifications (L7 and FC7).

2.77 Finally, the third instrumental variable considered by the CC, insured LOCI, is likely to be correlated to unobserved demand shifters in exactly the same fashion as self-pay LOCI. Unobserved demand shifters that vary at local level (such as different healthcare preferences or needs driven by age and income) are in fact likely to affect both insured and self-pay LOCI prices. This is because, from a consumer perspective, the factors that lead to a high demand for self-pay or insured private healthcare are likely to be similar and to induce a correlation between unobserved demand and prices. As a result, insured LOCI failed to meet the standard set by the second necessary condition set out by the CC (condition (b) above) and therefore cannot be considered a suitable instrument for self-pay LOCI.

The CC did not appropriately control for the competitive pressure exerted by NHS hospitals

2.78 As already submitted to the CC,[122] HCA faces some competitive constraints from leading NHS Trusts in London.

2.79 In its PCA, the CC sought to control for the competitive constraint exerted by the NHS by adding a control variable which captures the average waiting time at an NHS hospital (within a NUTS-3 area).

2.80 While HCA welcomes the fact that the CC tried to control for the NHS' competitive constraint, the CC did so inadequately. First, waiting time is not the only relevant competitive dimension and does not capture the full extent of the competitive constraint exerted by the NHS. Second, especially in London, there can be substantial differences in waiting times across NHS Trusts within the same NUTS-3 area. Third, and most importantly, the NHS waiting time control variable used by the CC measures waiting time *across all treatments*. This is a major concern, as waiting times can vary dramatically both across hospitals and across

[121] Appendix 6.9 to PFs, para. 60.
[122] See, for example, HCA's Response to the CC's Working Paper on Private Healthcare in Central London: Horizontal Competitive Constraints.

treatments. In fact, a self-pay PCA should precisely try to capture the different relationships between NHS and private provision across treatments depending on the quality of services (including waiting time) offered by the NHS.

2.81 Waiting times from referral to treatment, broken down by treatment function and NHS Trust or independent sector provider, are currently published on a monthly basis by NHS England. As an illustration of how waiting times can vary across NHS Trusts and treatments within NUTS-3 regions, the relevant waiting time figures for West London NHS Trusts for March 2013 are given in Table A2.1 below.

Table A2.1: Median waiting times from referral to treatment (weeks, March 2013)

NHS Trust[(1)]	General Surgery (e.g. gallbladder removal)	Trauma & Orthopaedics (e.g. hip replacement and knee replacement)	Urology (e.g. prostate resection)	All treatments
Barts Health NHS Trust	8	14	10	8
Chelsea And Westminster Hospital NHS Foundation Trust	7	7	5	7
Imperial College Healthcare NHS Trust	8	17	6	6
Royal Free London NHS Foundation Trust	4	12	5	4
Royal National Orthopaedic Hospital NHS Trust	n/a	9	n/a	9
University College London Hospitals NHS Foundation Trust	9	9	7	7
St. George's Healthcare NHS Trust	8	14	7	8

Source: Department of Health
Note: (1) The following NHS Trusts are not reported in the table, despite being located in Western London, because they do not appear to have had any patients in March 2013: Central and North West London NHS Foundation Trust, Central London Community Healthcare NHS Trust and East London NHS Foundation Trust. The following two hospitals have been excluded because they had no general surgery and trauma & orthopaedics patients in March 2013: Great Ormond Street Hospital for Children NHS Trust and South West London and St George's Mental Health NHS Trust

2.82 Across the seven NHS Trusts in this one NUTS-3 area, average waiting times from referral to treatment vary from 4 weeks to 9 weeks. The difference in waiting times between different treatments at these seven NHS Trusts is up to 13 weeks.

The CC did not appropriately control for demand side factors

2.83 In addition to the NHS "control" variable just discussed, the CC attempted to control for unobserved demand and cost characteristics by including average age in the population, average disposable income in the population and population density at NUTS-3 level in the regression.

2.84 HCA has two concerns with this approach. First, NUTS-3 areas are too large to rule out significant degrees of heterogeneity within them, especially in London (which is also inconsistent with the use of LOCI, as noted above), so that the average values have little meaning. Table A2.2 below shows that there is significant heterogeneity between Local Administrative Units (LAUs) within NUTS-3 regions for median incomes and the proportion of

the population aged 65+.[123] These figures suggest that average income and age are poor proxies for demand conditions at the LAU level let alone at the postcode level.[124]

Table A2.2: Descriptive statistics of demand drivers at NUTS-3 level (London Area)

NUTS-3 Regions	Median weekly pay for Local Administrative Units (LAU) (gross £ per week for full time workers – residence based, 2011)					
	Mean	**Median**	**Min**	**Max**	**Standard deviation**	**Coefficient of Variation**
Inner London – West	785	733	649	1,007	144	18%
Inner London – East	600	619	498	675	57	9%
Outer London – East and North East	567	579	501	609	37	6%
Outer London – South	622	629	575	671	43	7%
Outer London – West and North West	598	578	498	767	84	14%
	Percentage of population aged 65+, for Local Administrative Units (LAU) (Mid-2011)					
	Mean	**Median**	**Min**	**Max**	**Standard deviation**	**Coefficient of Variation**
Inner London – West	11	11	9	14	2	18%
Inner London – East	8	8	6	9	1	15%
Outer London – East and North East	13	12	10	18	3	25%
Outer London – South	14	13	12	17	2	16%
Outer London – West and North West	12	13	11	14	2	13%

Source: Regional and Local Division Office for National Statistics.
Note: the descriptive statistics are calculated on average values at LAU level. This suggests that the reported standard deviations underestimate the real variation in the data (since the descriptive statistics reported are a function of other underlying descriptive statistics).

2.85 Second, it is not clear at all why the mean should be the correct descriptive statistic to use to control for age and income in an area. On the presumption that private healthcare is more likely to be purchased by wealthier, older people, proxies such as the proportion of people in a certain area with an income over a certain amount, or above a given age, would be more suitable for the analysis.[125] Additionally, age makes a significant difference to the type of treatments required and the cost of these treatments, which would not be adequately controlled for by the inclusion of mean age as a variable. These economic arguments suggest that mean income and mean age are poor proxies for demand conditions and that unobserved factors (such as fraction above a certain age or above a certain income level),

[123] See also the evidence on heterogeneity in unemployment rates, mortality rates and house prices, within the same NUTS-3 area, provided by HCA in HCA's Response to CC in relation to Data Room exercise and the CC's Working Paper: Price concentration analysis for self-pay patients, Table 12.
[124] The results reported in Table A2.2 are calculated on the basis of descriptive statistics at LAU level. For this reason, HCA notes that the standard deviations reported in the table are likely to understate the actual variation of the data.
[125] HCA's advisers have not been able to perform this robustness check while in the Data Room due to the limited time available.

are likely to be omitted from the CC's regression analysis. These factors are likely to be correlated both with LOCI and with price.

2.86 In addition to the considerations set out above, HCA also notes that in all the model specifications in which the CC considered these NUTS-3 demand controls, these variables are never individually statistically significant. HCA's economic advisers tested the joint statistical significance of these variables and the test always failed to reject the null hypothesis that these controls are not jointly statistically significant. The suitability of these controls is therefore rejected by the data, confirming HCA's claim that the CC's PCA does not adequately control for demand shifters.

(5) THE RESULTS OF THE CC'S PCA ARE IRRELEVANT FOR PRIVATE HEALTHCARE PROVISION IN LONDON

2.87 This section sets out the reasons why the results from the CC's PCA cannot be deemed to be applicable to London or to HCA.

2.88 The CC wrote:

> *"the estimated relationship when pooled across operators is an estimate of the price-concentration relationship at a general level. [Our main results] indicate that there is evidence of a general relationship, and we have explained that this is an average across operators and focal treatments. To that extent, the main results are representative of the behaviour of all hospitals and operators included in the analysis."* [126]

2.89 The second and third statements in the quoted paragraph are simply wrong: the main results, which are averages across the only five operators considered and across the only four focal treatments considered, are *not representative of all five hospital operators included in the analysis*, let alone of all private healthcare treatments.

2.90 What the CC found in its PCA is a relatively strong correlation of local concentration with self-pay prices in the case of one hospital operator (Nuffield Health[127]) and no correlation for the remaining operators.[128] The CC simply cannot combine these two results and state that it has found a weighted effect *"at a general level"*,[129] or *"representative of the behaviour of all hospitals and operators included in the analysis"*.[130]

2.91 As part of the robustness checks of the CC's analysis, while in the Data Room, HCA's advisers noted that replicating the CC's econometric analysis excluding all observations pertaining to Nuffield Health, the PCA's OLS results show that the coefficient on local market concentration (proxied by LOCI) is not statistically significant for the four remaining hospital operators as a whole. Further, upon implementing the same robustness check (i.e. excluding Nuffield Health), the IV results are less robust. In particular, the coefficient associated with LOCI is no longer statistically significant in the IV specification L7 (the CC's preferred specification), among others, as shown in Table A2.3 below. This result is evidence of the fact that the CC's PCA results are largely driven by a single hospital operator (Nuffield Health) and therefore the CC cannot draw general conclusions on the relationship between local market concentration (as proxied by LOCI) and self-pay prices from its PCA.

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[126] Appendix 6.9 to PFs, para. 85.
[127] HCA notes that, somewhat ironically (given the PCA results), the CC has not identified an AEC in relation to Nuffield Health.
[128] Appendix 6.9 to PFs, Table 13.
[129] Appendix 6.9 to PFs, para. 85.
[130] *Ibid.*

Table A2.3: Comparison between the coefficients estimated by the CC on the main explanatory variables in its PCA (LOCI and fascia counts) and corresponding estimates excluding Nuffield Health (IV model specifications)

	LOCI Specifications			
	L4	L5	L6	L7
CC's estimates	-0.304***	-0.466*	-0.137**	-0.152***
Estimates excluding Nuffield Health	***-0.448****	***-0.411****	***-0.093***	***-0.102***
	Fascia Count Specifications			
	FC4	FC5	FC6	FC7
CC's estimates	-0.044**	-0.076	-0.039**	-0.041***
Estimates excluding Nuffield Health	***-0.065****	***-0.158***	***-0.020***	***-0.034****

Source: Analysis by HCA's advisers of the PCA data available in the Data Room.

*Note: ***/**/* indicates statistical significance at the 1%/5%/10% level.*

2.92 The CC seemed to justify its approach to pool all the data on the basis of greater precision of the results:

"Increasing the number of observations typically increases the precision of the estimates, and thus the pooled approach is expected in general to be more precise than the operator-level approach." [131]

2.93 In stating so, the CC failed to recognise that precision *per se* has little value in econometric work, if the effect of interest is measured "precisely" but incorrectly. Further, the CC seemed to dismiss the value of within-operator data variation.[132] In a PCA such as the one undertaken by the CC, this type of variation can actually be very important, as it may allow assessment (provided all other factors are kept constant) of the extent to which a given operator is able to increase prices if it were to have an exogenously larger local market share.

2.94 In addition, the CC appeared inconsistent in its quest of a "general relationship" or a "broad relationship". The CC sought to identify a *"broad price-concentration relationship across the industry as a whole"*, around which its *"main hypothesis"* is based.[133] It therefore confirmed pooling observations from all hospital operators into a single regression, paying little attention to the results from operator-level analysis. By contrast, it only selected four self-pay treatments for its PCA (down from the eight considered in its AIS and in its Working Paper).

2.95 The fact that the PCA only considered four treatments (coming from only three specialties) casts some serious doubts over the extent to which the CC can extrapolate any relationship across all private healthcare treatments, or at least all the 16 specialties (plus oncology) it has focused its investigation on. This issue is particularly relevant for HCA. While the CC sought to defend its choice by arguing that these four treatments account for about 60% of inpatient episodes or revenue, this proportion is much lower in the case of HCA, where the four focal treatments jointly accounted for [✂] of UK self-pay inpatient episodes (or [✂] of

[131] Appendix 6.9 to PFs, para. 89.
[132] Appendix 6.9 to PFs, footnote 49.
[133] Appendix 6.9 to PFs, para. 21.

HCA's UK self-pay inpatient revenues) over the period from 2009 to 2012.[134] Also, as a result of the data exclusions and the selection of the four focal treatments, the dataset for the PCA includes [✂] observations for HCA (while the hospital dataset submitted by HCA recorded information for [✂] self-pay patient episodes in the UK). The CC implicitly acknowledged this in its own PCA, where it was forced to drop HCA from the operator-level analysis because there were too few HCA data points.[135]

2.96 In sum, any conclusion on the competitive outcomes in central London that was based on the CC's PCA would be fundamentally misplaced.

(6) CONCLUSION

2.97 In summary:

- The effect of local market concentration on self-pay prices as identified by the CC is at best very weak, both statistically and in terms of the estimated magnitude of the effect;
- There are a number of methodological flaws with the CC's PCA that fundamentally undermine its relevance to HCA. In particular, the PCA:
    - completely omitted data from PPUs and independent hospitals (the PCA was carried out in spite of 55% of invoices missing in London);w
    - only considered four focal treatments (from just three specialties overall), which are not representative of HCA's business, as they account for [✂] of UK self-pay inpatient episodes (or [✂] of HCA's UK self-pay inpatient revenues) between 2009–2012;
    - failed to adequately control for key factors such as episode quality, complexity and costs;
    - failed to adequately control for the competitive constraint from the NHS and for other "demand-side" factors;
    - used instrumental variables that failed to meet the standards that the CC itself explained instrumental variables should meet for an analysis to be robust; and
    - relied on a local concentration measure (LOCI) which is largely untested, presents severe methodological problems and is sensitive to very small changes in the data.

2.98 In sum, the weaknesses in the CC's PCA are so significant that this analysis cannot constitute evidence supporting the CC's provisional finding of an AEC due to *"weak competitive constraints in [a local market such as] central London"*.[136] Moreover, even if the CC persisted in using the evidence from its PCA for an assessment of competitive constraints in the supply of private healthcare in the UK (which HCA believes the CC should not), HCA firmly submits that any conclusion on the competitive outcomes in *central London* that was based on the CC's PCA would be fundamentally misplaced.

[134] This data has been computed on the basis of HCA's entire patients' database.
[135] Appendix 6.9 to PFs, para. 91.
[136] PFs, para. 72.

2.99 As a result of these considerations, any divestment remedy imposed on HCA based on an analysis that has no relevance to London would be fundamentally flawed.

3. APPENDIX 3: A TECHNICAL CRITIQUE OF THE CC'S ANALYSIS OF THE BARGAINING FRAMEWORK[137]

Summary

3.1 In order to correctly assess the extent of the relative bargaining power between two negotiating parties, one needs to assess the value of the alternatives available to the negotiating parties in the case of a breakdown in their negotiation. The CC carried out this assessment incorrectly in its Provisional Findings, for a number of reasons set out in Section 7. One of these is that it mostly focused on the value of the alternatives available to the negotiating parties in the case of a permanent breakdown in the negotiations (for example, permanent delisting of a hospital facility by a PMI).

3.2 This Appendix sets out a theoretical model – based on standard bargaining theory – which considers the value of alternatives available to negotiating parties (private healthcare providers and PMIs) that are relevant both in the case of a permanent breakdown in the negotiations and in the case of a temporary breakdown. In the interests of clarity, and consistent with the economic terminology used in bargaining theory, the former is referred to as an "outside option" (for each party) while the latter is referred to as an "inside option" (for each party).

3.3 Importantly, the model set out in this Appendix considers outside and inside options *jointly*. This is to reflect how negotiations take place in reality: parties do expect that following a temporary delisting of one or more facilities they will have a chance to negotiate again.

3.4 The model presented in this Appendix allows the isolation, in a theoretically rigorous yet transparent way, of the key drivers of bargaining power for the private healthcare providers and the PMIs.

3.5 This Appendix demonstrates how the CC's assessment of the relative bargaining strengths of private healthcare providers and PMIs was inaccurate. Specifically, by not giving sufficient weight to the value of the alternatives available to parties in the case of *temporary* breakdown in the negotiations (e.g. temporary delisting of a facility), the CC missed a key feature of how negotiations between private healthcare providers and PMIs take place and thus potentially substantially underestimated the bargaining power of the PMIs.

Background and scope of analysis

3.6 The CC has acknowledged various levers through which in particular large PMIs can exert their bargaining power, including through:

- restricted networks and the flexible use of guided referrals;[138] and
- the threat of delisting.[139]

3.7 In addition, the CC acknowledges that PMIs can exert bargaining power particularly in the case of recognition of new facilities.[140]

[137] The formal economic analysis in this Appendix has been largely developed by Prof. Roman Inderst, supported by HCA's economic advisers.
[138] CC, PFs, para. 6.171–6.172 and 6.176.
[139] CC, PFs, para. 6.170.

3.8 However, the CC seems to conclude that:[141]

- the evidence on bargaining strength was inconclusive overall;
- the use of restricted networks and guided referrals was limited (*"PMIs do have scope to take some business away from private healthcare providers, but that does not of itself constitute buyer power"*); and
- for most PMIs the option of delisting did not confer to them much bargaining power (*"Under certain circumstances the scope to delist hospitals, because of the potential damage to a private healthcare provider, could give a PMI buyer power. However delisting is damaging to a PMI and is not an option that can be freely used. The evidence does not indicate that it is a realistic option for any PMIs other than the largest (Bupa and AXA-PPP) and it does not indicate that for these PMIs the bargaining strength conferred amounts to fully countervailing power"*).

3.9 This Appendix sets out an analytical framework, based on standard economic (bargaining) theory, suggesting that, in reaching these conclusions, the CC's reasoning is not convincing in the following two ways.

3.10 First, the CC focused on the value of the alternatives available to the negotiating parties only in the case of a permanent breakdown in the negotiations (for example, permanent delisting). The CC therefore failed to assess the significance of the value of the alternatives available to parties following a temporary breakdown in the negotiations. In the interest of clarity, the former is referred to as an "outside option" (for each party) while the latter is referred to as an "inside option" (for each party). Both sets of alternatives to agreeing with the other party fall under the definition of "outside option" used by the CC and are key determinants of bargaining power.

3.11 Second, the CC failed to conduct an analysis of the relative strength of these options (where an analysis of the market in which PMIs operate would also be required).

3.12 The analytical framework set out in this Appendix suggests that the CC should have taken into account the following aspects in its assessment:

Assessing the significance of "outside options"

a. Even when a breakdown of negotiations and thus a permanent delisting of hospitals would inflict a large damage on either party (i.e. a private healthcare provider or a PMI), this should not imply that the size of the respective "outside options" is irrelevant as a determinant of relative bargaining power.[142] Even when the damage that a breakdown of negotiations inflicts on one party is large, its outside option could still confer considerable bargaining power when the damage that a breakdown of negotiations inflicted on the counterparty was even larger. That is, even when the respective damage in case of a breakdown was large for either party, it is still the relative difference in the respective damage potentially inflicted that matters as a key determinant of bargaining power.

[140] CC, PFs, para. 6.173–6.175.
[141] CC, PFs, para. 6.189.
[142] CC, PFs, para. 6.169.

b. More specifically, as set out below in more detail, standard bargaining theory has established that what drives bargaining power is the difference between the values of the two sides' outside options. When disagreement is easily accommodated by either party, so that the respective loss from a breakdown of a negotiation is small, the difference between outside options (compared to the expected agreement from negotiations) is likely to be small, so that outside options are unlikely to be decisive for the relative bargaining power of either side. The opposite result arises when a breakdown inflicts a large damage on either party.

c. The CC's arguments for why outside options in the case of a permanent delisting are of limited relevance as determinants of bargaining power seem to rely also on the observation that there was little evidence of actual delisting as a result of a dispute.[143] But the importance of an outside option as a determinant of bargaining power should not be assessed based on the frequency with which a permanent breakdown of negotiations has occurred in the past. In fact, standard models of bargaining do not predict that a breakdown will occur in practice other than in exceptional circumstances.

d. As a result of the CC not properly acknowledging the importance of the relative value of outside options (even when a breakdown of negotiations inflicts a large damage on either party), the CC has failed to undertake a sound assessment of bargaining in the inquiry. Such a sound assessment would have instead required an analysis of how easily (and at what costs) private healthcare providers, as well as PMIs, could permanently substitute for particular counterparties.

Assessing the significance of "inside options"

a. The CC does not seem to fully appreciate the importance of what bargaining theory calls the "inside options" during negotiations. These are the respective profits that parties can realise during a disagreement, while they are still trying to resolve the dispute. The evidence collected by the CC suggests, however, that the ability to accommodate a breakdown in negotiations (for example, temporary delisting) and the parties' steps to enhance this ability (for example, through contingency planning) affect the parties' bargaining power. To the extent that private healthcare providers and PMIs are rather differently affected by such temporary delisting, their relative bargaining power could then be determined by the relative value of these inside options. This has not been appropriately analysed in the CC's overall assessment of the PMIs' bargaining power.

b. Consequently, the CC did not provide a detailed analysis of the respective (short-run) capabilities of private healthcare providers and PMIs to react to a temporary breakdown in negotiations. This too would require an analysis of the market in which PMIs operate, including the nature of contracts with corporate clients and their expected reactions in the short run, following a temporary delisting of a hospital.

3.13 This Appendix proceeds as follows. First, it introduces a simple modelling framework to study the joint relevance of both outside and inside options.[144] Second, it analyses the main

[143] CC, PFs, para. 6.166–6.170.

[144] Annex 1 provides a summary of how the bargaining theory literature explored these issues. In particular, the original literature on the outside option principle was an important first step in understanding bargaining principles, but more recent contributions have provided a more balanced and realistic approach to understanding further constraints faced by bargaining parties.

features of the equilibrium of the model (i.e. what one would expect to occur if every party behaved according to its best interests), focusing on the key drivers that determine the relative bargaining strength of each party. Third, based on the lessons that are drawn from the characteristics of this equilibrium (derived through traditional bargaining theory methods) this Appendix sets out when large PMIs are likely to have substantial bargaining power vis-à-vis all private healthcare providers.

3.14 As the formal analysis set out below will suggest, a sound assessment of bargaining power would require an analysis of the market in which the PMIs operate, something which the CC has failed to undertake in spite of several submissions from parties to do so from an early stage of the inquiry.[145]

Modelling Framework

3.15 This section sets out the main assumptions of the model, in line with traditional bargaining theory, but with an effort to match certain specific features of the relationship in the real world between private healthcare providers and PMIs.

3.16 More specifically, the analysis presented in this Appendix provides a simple model that allows the identification of the key determinants of bargaining power applied to negotiations between PMIs and private healthcare providers. For it to be comprehensive and methodologically sound, such a formal analysis of negotiations between private healthcare providers and PMIs must be able to distinguish between what happens when negotiations finally break down ("outside options") and what happens when there is only a temporary disagreement and thus temporary delisting ("inside options"). As the analysis shows, both factors affect the expected outcome of a negotiation.

3.17 The model set out below is kept simple so as to identify the key effects in a transparent way. As with most of the theoretical bargaining contributions on which the following analysis draws, the purpose of the analysis is thus not to map the exact details of a particular negotiation process.[146] Rather, its purpose is to identify the forces that affect the bargaining power of the two parties, namely PMIs and private healthcare providers in the context of interest. After presenting the results from the basic model, this Appendix discusses how further features of the bargaining process may be incorporated and what their likely impact would be on the outcome of a negotiation.

Bargaining protocol

3.18 The analysis considers negotiations between a single private healthcare provider (called "H", say) and a single insurer ("PMI"). The analysis allows for the possibility of two rounds of negotiations.

3.19 At an initial period, $t = 0$, either side is chosen with some probability to make an offer to the other party. If the other side rejects the offer, the negotiation moves on by one period until at $t = 1$ another (final) offer may be made. The existence of more than one bargaining period (consistent with the real world), or more precisely the existence of a time-span between multiple periods, allows the impact of the inside options to be assessed, i.e. how well the two parties can adjust following a disagreement that is only temporary. Again, at $t = 1$ ether

[145] See, for example, HCA's Response to the Issues Statement, para. 10.66.
[146] For example, to keep the model tractable, the analysis allows for two rounds of negotiations (at most). This restriction is not material to the results, as will be shown in Annex 2.

side is chosen with positive probability to make an offer. If there is (again) disagreement, the respective outside options are taken and negotiations stop.

3.20 At time $t = 0$, if there is temporary disagreement, it is not known which party will make the final (take-it-or-leave-it) offer at $t = 1$. In equilibrium, as with standard bargaining models, provided that this stage ($t = 1$) is reached, there will be an agreement for sure at the end of $t = 1$. As the negotiation takes place over a finite horizon, payoffs (i.e. what each party gains from the negotiation, or profits) can be derived through backward induction starting from the final period, as with standard economic (game theory) models.

3.21 The random choice of which party makes the offer in the final period ($t = 1$) ensures that neither party is (artificially) given extreme bargaining power (since that party would have the chance to make a final take-it-or-leave-it offer). Suppose that at this final stage H is randomly selected with probability β , while the PMI is chosen with probability $1 - \beta$, where both are larger than zero. To be agnostic about a particular choice for β , the model assumes $\beta = \frac{1}{2}$. (Annex 2 derives the respective expressions for the general case.) That is, at time $t = 0$, if no immediate agreement is reached, both sides expect to have an equal chance of making a final offer in the following (final) period, i.e. at $t = 1$. The value of the outside option, which is realised when there is still no agreement at the end of this final period, represents the payoff (or profit) that a party realises when it is *not* (randomly) chosen to make the final offer.[147]

3.22 Turning to $t = 0$, again the random choice of which party makes an offer ensures that the chosen bargaining protocol does not grant one side excessive bargaining power simply by assumption. The following analysis will focus on the expected profits that the private healthcare provider H and the PMI realise in expectation, i.e. before it is determined which party makes the first offer (at time $t = 0$).[148]

3.23 The outcome of negotiations between the PMI and H is captured in the following straightforward way. As the analysis in this Appendix does not intend to shed light on the particular details of contracts between private healthcare providers and PMIs, it is stipulated that there is a single overall price ("transfer") that the PMI pays.[149] This may be thought of as

[147] As discussed below, outside options would also matter for both parties in a bargaining game with an infinite time horizon where parties make alternating offers. The combination of a finite time horizon together with a random choice of proposer allows characterising the equilibrium more transparently through backward induction from the final period. It is also common in the more applied literature. For instance, this was used in Inderst (2002) to study negotiations over non-linear contracts. In particular, the random choice of a proposer (also in a more elaborate game with open time horizon) is also very common when bargaining between more than two players is modelled (in political economy, industrial organisation or the theory of the firm). In fact, with multiple PMIs and hospital operators, a standard axiomatic bargaining solution that is typically applied in such settings (the Shapley value) is typically supported precisely by such a game with random choice of proposer in each period.

[148] Rather than being merely a tool to ensure that bargaining power is not asymmetrically allocated by design, the characterized outcome could also represent an average over different bargaining situations, where the respective choice of proposer then reflects, say, the bargaining skills of the individual executives.

[149] Though this is not needed for the analysis, one may denote the total transfer by T .

a price index, covering a set range of treatments offered by H. In exchange for this transfer, the PMI buys the "capacity" $q^* \leq Q$ from H, where Q denotes H's maximum capacity.[150,151]

Outside and Inside Options for the private healthcare provider

3.24 Let $q_0 = Q - q^*$ be H's residual capacity when there is an agreement with the PMI. Assume the private healthcare provider H incurs fixed costs F and a (constant) marginal cost c per unit of output (capacity). When there is an agreement, H may sell capacity q_0 to other parties (to fix ideas, think of them as self-pay patients). Suppose that the unit price that can be charged to self-pay patients is p_0. Thus, when there is an agreement with the PMI, private healthcare provider H incurs total costs of $F + c(q_0 + q^*)$. In return, it earns the transfer from the PMI (yet to be determined) and revenues of $q_0 p_0$ from the self-pay market.

3.25 When there is no agreement at $t = 0$, as the analysis below will make clear, both sides should still (rationally) expect that there is only temporary disagreement rather than a full breakdown of negotiations. Still, the private healthcare provider will have an incentive to mitigate the loss of business due to a temporary breakdown of the negotiation (for example, due to temporary delisting), lasting from $t = 0$ to $t = 1$. In the model, this will occur through an attempt to sell additional capacity through a different channel. In the real world, this may amount to selling capacity to the NHS or, possibly, not selling capacity at all due to a lack of a counterparty willing to deal. The profits that the private healthcare provider thus makes through this different channel constitute the value of H's "inside option". How this is determined is discussed next. The volume of business sold in this case is determined by q_d.

3.26 If an agreement is reached between H and the PMI, H's total capacity can be written as $Q = q^* + q_0 + q_S$, where $q_S \geq 0$ denotes unused (spare) capacity. To be specific, suppose that, outside the business with the PMI, there is a downward sloping-inverse demand function, $P(q)$. The private healthcare provider would maximise $[P(q) - c]q$. Denote the maximand by $\tilde{q}$. If $q_S > 0$ is truly unused capacity, then $q_0 = \tilde{q}$ and $p_0 = P(\tilde{q})$ must hold by optimality. In this case, $q_d = q_0$ holds, so that H cannot profitably adjust its capacity when there is temporary disagreement. (Of course, it could sell more of its capacity on the "market" outside the PMI, as captured by the inverse demand $P(q)$, but the resulting price decrease would make this unprofitable.)

3.27 Suppose instead that q_S=0 so that there is no (truly) free capacity when there is an agreement with the PMI. Formally, then $q_0 < \tilde{q}$ may hold. In this case, H could mitigate the loss from a temporary breakdown in negotiations by optimally adjusting the level of capacity that is sold through other channels. By expanding that capacity, however, the inverse

[150] Of course, in the real world, a hospital cannot predict with certainty how many patients a PMI will bring to it. The model implicitly assumes, for simplicity but without loss of generality, that every policyholder will be a patient, so that q^* constitutes the capacity that hospital H must reserve for the PMI.

[151] The derivation of q^* is not the focus of this Appendix. Instead, the focus is on how the resulting (net) surplus is shared between the two parties. As is standard in games with symmetric information, if this was also endogenised, then it should be at least bilaterally efficient. Precisely, given the allocation of capacity to other buyers and given the PMI's other contracts, q^* would maximize the bilateral surplus. When all other transactions are also determined through negotiations, one needs to solve for an equilibrium in a network of negotiations, which is not the focus of this Appendix (see Inderst and Wey 2003 for an analysis without competition and, more recently, De Fontenay and Gans 2013 and Inderst and Pfeil 2013 for solution concepts with competition).

demand function $P(q)$ would imply a lower price for all services that are sold through other channels than the considered PMI.[152] This may be realistic even in the presence of existing contracts, as these may involve volume discounts for H's services. Further, uniform pricing typically applies in the self-pay market. To be conservative from the private healthcare provider's perspective (i.e. making an assumption that makes the value of its inside option higher than otherwise) the analysis assumes that H can still charge the (average) price p_0 when it optimally expands (temporarily) sales through other channels from q_0 to q_d. (Recall however that already the existence of unused capacity would suggest that there is limited scope for a profitable short-term adjustment in this fashion.) Thus, if there is a temporary breakdown in the negotiations at $t = 0$, the private healthcare provider can mitigate the loss incurred (due to the lost PMI business) by realising the additional profits $(q_d - q_0)(p_0 - c)$ from other sources of demand. Taking all other costs into consideration, the "inside option" that is realised during the (short-term) disagreement following $t = 0$ is equal to $q_d(p_0 - c) - F$.

3.28 Consider now the (potential) permanent disagreement at the end of time $t = 1$. Again, as with the temporary disagreement discussed above the profits that H could realise without the PMI could be represented by a downward-sloping (inverse) demand function. It is not clear whether the long-run flexibility of the private healthcare provider to make up for losses (i.e. following permanent disagreement with the PMI) is larger, the same or smaller than the short-run flexibility. On one hand, as the private healthcare provider may be able to plan more widely how to optimally make use of its capacity without access to the patients of the PMI, this may improve its outside option. On the other hand, there may be various factors that decrease the respective profits relative to what H still obtains during temporary disagreement. For instance, when consultants no longer have access to the PMI's business at the delisted hospital(s), it may be harder to retain them at those hospitals ("consultant drag" effect). Losing consultants may in turn make the delisted hospitals even less attractive to patients (and corporate customers on their behalf). As in the case with temporary disagreement only, the outside option is captured for simplicity by assuming that H will now optimally sell through these channels the capacity q_D at the prevailing price p_0. The further analysis holds irrespective of whether $q_D \geq q_d$ or $q_D \leq q_d$.

3.29 As discussed below, depending on the application and the chosen bargaining protocol, the academic literature has often considered either outside options or inside options separately. In this Appendix the aim is to explore all the main determinants of bargaining power jointly, rather than isolating one particular source of it. Further, the two periods are given equal weight in the profit function of H and the PMI (see the more general derivation in Annex 2).[153]

Outside and Inside Options for the PMI

3.30 Whether the PMI can offer the particular hospital(s) to policyholders or patients (possibly via corporate clients) will determine their willingness to contract (and their willingness to pay for medical insurance). To fix matters, when there is agreement with H, assume that the PMI can realise profits of π per period (excluding the payment that it makes to H).

[152] The seller's losses from reallocating capacity over fewer buyers (following temporary or permanent breakdown) has more generally been used as a source of buyer power in Inderst and Wey (2007).

[153] The finite time horizon also allows to abstract from discounting, which could easily be introduced without affecting results qualitatively.

3.31 Next, the inside and outside option profits for the PMI are determined. Suppose first that there is a temporary breakdown in negotiations at $t = 0$, resulting in a temporary delisting. In equilibrium, it is (rationally) expected by both parties that there will be agreement at $t = 1$ (see below), so that the delisting is in fact only temporary. Hence, the PMI as well as its corporate clients can expect that from there onwards, i.e. after $t = 1$, H will again be part of its network. Further, note that contracts typically provide clauses that at least temporarily allow the PMI to substitute individual hospitals. Such a possibility of substitution, provided that the hospital is included in a (restricted) network in the first place, is clearly also given under guided (or open) referrals. Finally, to the extent that contracts between PMIs and corporate clients are of longer term, when a temporary breakdown of the relationship leads to a temporary delisting of a hospital, this also protects the PMI from a loss of corporate clients.

3.32 Suppose that temporary substitution of the services that would be provided by H comes at the same cost to the PMI as the price that H receives from other customers, namely p_0. As this will not be a key parameter for the subsequent analysis and its interpretation, this specification is not crucial. Further, suppose that in case of a temporary delisting the PMI retains over the short term the fraction α_d of its business. The previous arguments already suggest that the difference $1 - \alpha_d$ should be relatively low (i.e. the PMI is unlikely to lose much corporate business in the short run following a delisting). In the longer term, the corresponding fraction may differ, and is denoted by α_D. Again, the following analysis holds irrespective of whether $\alpha_D \geq \alpha_d$ or $\alpha_D \leq \alpha_d$.

3.33 As with the private healthcare provider H, the PMI is likely to take actions to compensate for the delisting of H. This could also imply price concessions for particular corporate clients so as to retain their business. It is again straightforward to accommodate such a decreasing (inverse) demand curve into the analysis without affecting results qualitatively. Following the specification set out above, the values of the inside and outside options (relative to profits from an agreement) are mainly driven, respectively, by α_d and α_D; that is, two key drivers of a PMI's bargaining strength are (i) the fraction of business that it manages to retain in the short run following a temporary breakdown in the negotiation with a private healthcare provider (for example, due to temporary delisting) and (ii) the fraction of business that it manages to retain in the long run following a permanent breakdown in the negotiation with a private healthcare provider (for example, due to permanent delisting).

Bargaining Outcome

3.34 As long as there are mutual gains from an agreement, bargaining theory predicts that there will be an *immediate* agreement, i.e. at $t = 0$, in the model set out in this Appendix. Formally, in equilibrium, the party that is (randomly) chosen as making the offer at time $t = 0$ will make an offer that is accepted by its counterparty.[154] Still, to determine the expected equilibrium outcomes (i.e. how total profits are shared) one must proceed in steps.

3.35 As is standard, the bargaining game is solved backwards. Take thus the final period in which an offer can be made, $t = 1$. At this stage, the bargaining game also prescribes that either side can be chosen with positive probability to make an offer. This offer is then also the

[154]The equilibrium concept used in this Appendix is the Subgame Perfect Equilibrium, in line with economic (game) theory. This simply requires that all parties behave optimally when it is their turn to take an action and also anticipate such behaviour by their opponent and in the future.

ultimate (take-it-or-leave-it) offer of the full game. Consequently, by optimality the party making an offer will make an offer that reduces the payoff (profit) of the counterparty down to the value of its respective outside option.

3.36 The expected outcome at time $t = 1$, once this stage is reached after a temporary delisting, affects in turn bargaining at the initial stage $t = 0$. At that point, the offer put forward by the party chosen to make the first offer must take into account both the inside option of the counterparty (i.e. how this party could accommodate a temporary delisting) as well as the subsequent agreement that will be reached in $t = 1$. The party randomly selected to make an offer at time $t = 0$ will optimally make an offer that makes its counterparty (just) indifferent between accepting and rejecting it. Note once more that this offer thus incorporates both the value of the inside option from a temporary delisting in case of a rejection and the value of the outside option that would result from permanent breakdown.

3.37 The formal details of these two steps are derived in Annex 2. Denote the expected *ex ante* profits of the PMI and of H by u_{PMI} and u_H, respectively. When each side is chosen as a proposer with equal probability, then these are given by:

$$u_{PMI} = [\pi + q_0 p_0 - (q_0 + q^*)c] + \frac{1}{2}(\pi - q^* p_0)(\alpha_d + \alpha_D) - \frac{1}{2}(p_0 - c)(q_d + q_D) \quad (1)$$

and

$$u_H = [\pi + q_0 p_0 - (q_0 + q^*)c] - 2F + \frac{1}{2}(p_0 - c)(q_d + q_D) - \frac{1}{2}(\pi - q^* p_0)(\alpha_d + \alpha_D). \quad (2)$$

3.38 These expressions are intuitive. If the two profits u_{PMI} and u_H are added together, this yields the joint aggregate surplus:

$$2[\pi + q_0 p_0 - (q^* + q_0)c - F].$$

3.39 This term aggregates over both periods the following components of joint profits: the PMI's revenues (gross of the transfer that is made to H) π; the additional profits that H obtains from selling capacity q_0 through other channels; and the total costs of H incurred in the provision of these services. Both the PMI and the H obtain a share of these gross profits. The relative magnitude of each share is driven by the values of the parties' inside and outside options. The various determinants of the sharing rule and thereby of bargaining power are discussed in the next section.

Key Parameters and the Distribution of Bargaining Power

3.40 The main message from the formal analysis is that both inside and outside options matter for how bargaining power is distributed. Both should thus be assessed properly to understand, in the context of the private healthcare industry, how bargaining power is distributed between a private healthcare provider and a PMI.

3.41 The following discussion turns first to the determinants of the two parties' inside options and their overall relevance. As noted above, the CC does not seem to have fully assessed the relevance of these options. Next, the determinants of the outside options are discussed. As

noted above, the CC seems not to have carried out an analysis of the relative size of the two sides' outside options as a key lever of bargaining power.

Determinants of Inside Options

3.42 The inside options of the two parties depend on the key parameters α_d and q_d, respectively. Recall that $1-\alpha_d$ denotes the fraction of business that the PMI loses in the short term when there is a temporary delisting. Likewise, $q_d - q_0$ is the additional business that H can secure elsewhere in the short term so as to partially compensate for the loss of the PMI's business (q^*). Recall also that it is inconsequential for the qualitative insights of the analysis that the price p_0 for these services remains constant.

3.43 As is immediate from the expressions for u_H and u_{PMI}, when α_d is higher, then this positively affects the PMI and negatively H: the higher the value of the PMI's inside option, the larger its bargaining power (the lower H's bargaining power).

3.44 Likewise, when q_d is higher, then this positively affects H and negatively affects the PMI: the higher the value of H's inside option, the larger its bargaining power (the lower the PMI's bargaining power).

Determinants of Outside Options

3.45 To keep the model agnostic, the inside and outside options were chosen symmetrically. Hence, α_D and q_D capture the respective ease with which the PMI and H can adjust to the full loss of their mutual business after a permanent breakdown of negotiations. Again, as with the more short-term inside options, it follows from the expressions for u_H and u_{PMI} that a higher value of α_D affects the PMI positively and H negatively, while when q_D is higher, then this positively affects H and negatively affects the PMI.

Possible determinants of α_d in the private healthcare industry

3.46 The fraction of business that the PMI may retain when there is only a temporary disagreement (resulting temporary delisting) depends on a number of variables. All else equal, α_d is expected to be higher when:

- The larger the proportion of PMI's contracts with corporate clients that contain guided (or open) referral clauses;
- The less corporate clients respond, by changing PMI provider, to a change in hospital networks by a given PMI;
- The higher the extent to which the PMI can, at least temporarily, substitute a certain hospital facility with another, as part of their agreement with a corporate client;
- The higher the switching costs for a corporate PMI client wishing to change PMI (these costs may include transaction costs and administration costs, for example due to having to deal with own staff; they may also include PMI brand loyalty);
- The greater the ability of a PMI to delay, at least temporarily, a treatment (so that a patient may eventually be treated at a given hospital, after temporary delisting); and
- The higher the proportion of locked-in patients, i.e. patients who are unable to switch PMI provider due to existing medical conditions.

Possible determinants of q_d in the private healthcare industry

3.47 The fraction $\frac{q_d - q_D}{q^*}$ of the (temporarily) lost business with the PMI that H can replace through other channels depends on a number of factors. All else equal, q_d is expected to be higher:

- The lower the volume of PMI business lost at the temporarily delisted facility;
- The higher the volume of pent-up demand through other channels (e.g. longer NHS waiting lists); and
- The weaker the consultant drag effect (i.e. the lower the proportion of consultants who would stop practising at the delisted private healthcare facility due to the loss of patients from a given PMI).

3.48 To the extent that these factors are not applicable to (particular) private healthcare providers, their inside option value may be quite limited. In particular, q_d (or more precisely the fraction of temporarily lost business that can be replaced) will be relatively low for high-quality hospitals that mainly rely on self-pay and privately insured patients when:[155]

- there is only very limited pent-up demand (from waiting lists);
- there is already spare capacity even under an agreement with all PMIs.

3.49 In Annex 2, the equilibrium profits are more generally derived for the case where in each period H is chosen as the proposer with probability β. In bargaining theory, which was briefly reviewed above, one uses either different weights in the axiomatic Nash bargaining solution, different degrees of impatience or indeed also different probabilities with which a party is chosen as a proposer (typically in a given round of a game with open time horizon) to introduce an additional lever of bargaining power. Though this is not derived from primitives here, an additional lever of bargaining power could come from parties' financial strength, or more precisely from the interaction of the size of lost business and thus profits and the capability to absorb the respective foregone profits. Recall here that, as is immediate also from the expression for u_H, fixed costs must still be born by H. This is the case as these costs are also fully borne under the inside option. During temporary delisting the combination of fixed costs and lost revenues should thus exert considerable pressure on hospitals (high proportion of committed and operational costs).[156] All else equal, when q_d is low and α_d is high, and when the PMI accounts for a large fraction of H's business, then the presence of a financial constraint should thus generate additional bargaining power for the PMI.[157]

[155] Note that the CC already acknowledges that lost business cannot be replaced rapidly (see PFs, para. 6.159).

[156] Note also that in the PFs, the relevance of financial strength is already recognised, in particular in relation to the inside option (A6(11), para. 226: "*The financial strength of either party may influence their negotiating position as it will affect their ability to withstand a dispute, particularly if their expectation is that any costs will be short term and that the other side will make concessions first*".)

[157] Given the respective expressions that are derived in Annex 2, this would correspond to a lower value of β.

Possible determinants of α_D in the private healthcare industry

3.50 It should be noted again that for simplicity the value of the outside option for the PMI was captured by a single variable, which denotes the business volume that the PMI retains even when there is a permanent delisting of H. All else equal, α_D should be higher when:

- the competitive disadvantage of the PMI remains small as other insurers are also expected to either delist some of their hospitals or to reduce the volume of business with them (e.g. through the greater use of restricted networks that do not contain these hospitals);
- the use of guided referrals and restricted networks becomes more widespread; and
- the PMI can replace its required private healthcare demand (capacity) in the long run (e.g. by securing higher volumes with other hospitals or by sponsoring entry).

Possible determinants of q_D in the private healthcare industry

3.51 Once a particular PMI is lost to H, it is difficult for H to regain that PMI's patients easily. The reason is simply that the PMI may act as a gatekeeper to these patients. Typically H cannot lure these patients back (other than through self-pay), not even in the long-run, as H's services are only a small part of the overall package that (other) PMIs offer. All else equal, q_D should then be high(er) when:

hospital capacity can be diverted (to a significant extent) to self-pay patients;

- there are few or no knock-on effects, e.g. through the decision of consultants to cease working at these hospitals;
- delisting inflicts a competitive disadvantage on a PMI that is large enough to divert corporate customers away, allowing the private healthcare provider to regain lost patients through their business with other PMIs.

Concluding remarks

3.52 This Appendix serves two purposes. On a more conceptual basis, by analysing a formal model of negotiations and relating the outcome to the literature it is argued that: (i) outside options should matter even when breakdown of negotiations inflicts large damages on the two parties; and that (ii) inside options can play a key role in the overall determination of bargaining power. Second, with an application to negotiations between a private healthcare provider and a PMI, the simple model was used to discuss briefly key determinants of bargaining power through the lenses of the respective outside and inside options of the two parties. A sound assessment of the relative bargaining strength of private healthcare providers and PMIs must also be based on the evidence obtained from an analysis of the market in which PMIs operate, so as to compare their potential losses from a temporary as well as from a permanent breakdown of negotiations to those of private healthcare providers.

Annex 1: Outside Options and Inside Options in Bargaining Theory

Outside Options

3.53 The treatment of outside options is not uniform across even the most standard theoretical contributions to bargaining theory. The natural starting point however is the classic approach in axiomatic bargaining theory. For two-person bargaining problems this is arguably the so-called Nash bargaining solution. This corresponds fully to the outcome at the two stages of the non-co-operative model that was solved in this Appendix. Or, put differently, the same outcome would be obtained if one applied at each stage the Nash bargaining solution. This is indeed a very common procedure in most if not the overwhelming majority of applied work.[158]

3.54 Axiomatic (or co-operative) bargaining theory tries to provide robust predictions based on fundamental axioms. In contrast, non-co-operative bargaining theory sets up a specific bargaining protocol and then applies game theory to derive the equilibrium under these precise rules ("game form"). The well-known contribution of Binmore et al. (1986) shows that the relevance of outside options depends on the precise rules of the bargaining game.[159] More specifically, they show that the outcome in their alternating-offer bargaining game fully corresponds to that in axiomatic game theory when there is an exogenous risk of breakdown in each period, provided that the two sides have not yet come to an agreement. On the other hand, when no such risk of breakdown exists, so that the costs of continued negotiations originate from players' impatience only, they establish what has been called the "outside option principle". According to this result, outside options matter only when they are sufficiently attractive. In the next paragraph it is argued however that the outside option principle (OOP) implies quite extreme results and that it is furthermore not robust, as has been shown in subsequent work.

3.55 The starting point for the following discussion is a simple game where two sides alternate in making proposals. The role of inside options is discussed further below. When each period in which there is not yet an agreement there is an exogenous risk of breakdown of negotiations (in which case the two sides realise their respective "outside option" profits) then the unique equilibrium is that of the axiomatic Nash bargaining solution. Though the model presented in this Appendix uses a final negotiations stage (namely at t=1), as noted above the outcome then corresponds to that of such a bargaining game with an infinite time horizon.[160] In particular, outside options always matter and it is in particular the difference between their respective values that determines how the surplus is shared between the two parties.

3.56 Instead, the OOP, when it applies, postulates that an outside option should be relevant only when the respective payoff is not below the payoff that would be obtained as an equilibrium

[158]Precisely, according to the original contribution, which stipulates symmetry, the Nash bargaining solution maximises the so-called Nash product $(s_1 - d_1)(s_2 - d_2)$, where the pair (s_1, s_2) represents the respective outcome and the pair $(d_1 1, d_1 2)$) captures the disagreements (outside) options of two players $i = 1.2$. When utility is transferable (that is, in particular when the two sides are risk neutral) this corresponds exactly to the outcome where each side realises the value of its outside option plus one half of the net surplus. This can then be generalised to asymmetric sharing rules (cf. Roth 1979).

[159]See also Shaked and Sutton (1984).

[160]More precisely, the respective equilibrium concept is that of subgame perfect equilibrium. Furthermore, one typically looks at the outcome when the time between two consecutive offers (and thereby also the risk of breakdown if there is no agreement in a given period) goes to zero.

outcome in negotiations where there was no outside option (or one of value zero). When the outside option matters however, the outcome of negotiations is fully pinned down by its value, i.e. by what is now the value of the "binding" outside option. In this sense, when the OOP applies, the bargaining solution has a rather extreme prediction: an outside option either does not matter at all or, when it is sufficiently attractive, it fully pins down the outcome as each party realises exactly the value of its outside option (and not even slightly more).

3.57 While the OOP seems to capture the intuition that an outside option should be (more) relevant (or only relevant) if it is fully "credible", the extreme predictions, as discussed in the preceding paragraph, seem to lack realism. This may be one reason why it is not often used in more applied work.[161] (As noted above, this is also due to the application of the axiomatic Nash bargaining solution in applied work.) In addition, the OOP is also not robust, as is discussed next. In fact, the OOP was originally derived in a very specific setting. In particular, very specific assumptions are made there on when the two sides can "opt out" of negotiations (so as to use their outside options) and when not. Furthermore, the value of the outside option as well as that of the gross surplus are assumed to be constant over time and only subject to the same rate of discounting. Also this assumption is not innocuous and it may indeed be often more realistic that after a long impasse in negotiations the value from an agreement shrinks relatively fast, also as the two sides have then already made contingency plans or have started to shift business more permanently. All of these assumptions are however crucial for the OOP to hold.[162]

Relationship to Inside Options

3.58 As noted above, the simplest theoretical models of negotiations in the academic literature often ignore the value of an explicitly defined inside option during negotiations. In practice however the ability to hold out, say during strikes when firms negotiate with workers or during temporary delisting of goods when manufacturers negotiate with retailers, is arguably

[161]That said, the OOP may be used – as one possible alternative - when the respective work focuses on the sharing of "incremental surplus", e.g. from an investment.

[162]To highlight the relevance of the bargaining protocol, it should be noted that results change drastically in the discussed alternating-offer game (without exogenous risk of breakdown) depending on whether a party can opt out when it is chosen as responder or when it can opt out as a proposer. This goes back to the (long unpublished) contribution by Shaked (1987, 1994) and has since been recognised in various contributions (e.g., the early book by Osborne and Rubinstein 1990 or Ponsati and Sákovics 1998). The key observation here is the following. The proposer has a large bargaining power when she can opt out after rejection of her proposal: provided that the threat is credible, this is analogous to a take-it-or-leave-it offer. As today's proposer will be tomorrow's responder, she knows that the "large bargaining power" of today will become just a little bargaining power tomorrow. This makes the threat to opt out indeed credible. In addition, as this discussion also suggests, there are multiple equilibrium outcomes. Further, as an example for a change over time, take Dalmazzo (1992). He shows how the "split-the-difference" outcome, as in the axiomatic Nash bargaining solution, is obtained when the surplus from agreement decays over time (compared to the value of the outside option). A key difference is now that the bargaining game becomes non-stationary, since there exists a point in time when (after possibly long disagreement) there are no positive net gains from agreement left. A change over time also occurs quasi mechanically when bargaining is supposed to end in finite time. While from a purely theoretical perspective the assumption of an open time horizon may be technically more appealing, in reality the negotiating parties will anticipate that after a final time there must be an end to their haggling, just as in the model that is analysed in this Appendix. The literature has shown that the non-stationarity that is inherent in such bargaining games with finite time horizons provides another channel through which various (inside and outside) options that negotiating parties have at their disposal can simultaneously affect the resulting bargaining solution (e.g. Sloof 2004).

a key determinant of bargaining power.[163] As argued above, also in the present application of negotiations between private healthcare providers and PMIs the value of inside options should matter. The preceding analysis presented a simple model that captured this formally. As noted repeatedly, for simplicity the analysis considered a model in finite time, specifically with two periods only. The chosen set-up also allowed to combine inside options and outside options. It is argued next how inside options matter also when there is an infinite time horizon, so that there is no final offer in negotiations.

3.59 Take as a starting point the previously discussed model where negotiations proceed via alternating offer. Take also the particular specification where there is no risk of breakdown. When there is no agreement in a particular period, suppose that each side takes up its "internal option", namely in the present application the option to try to fill capacity through other patients or to possibly redirect patients. At least for the most simple case where this is a stationary payoff, it can be shown that the equilibrium outcome is exactly that predicted by the axiomatic Nash bargaining solution, where now the outside options are replaced by the discounted constant payoff stream from the inside option.[164]

3.60 As this seems important for the thrust of the argument in this Appendix, in this paragraph a game with an inside option, albeit now with an open time horizon, is briefly discussed somewhat more formally.[165] Suppose that two parties, say again the PMI and H, can negotiate – now more abstractly – over how to share the surplus S. This is now, as the game has an open time horizon, considered as a flow payoff (profit), which is generated in each period in which the agreement holds. Negotiations take place in a standard alternating-offer framework, say with H moving first in $t = 0$ (so that from there onwards the PMI can make an offer in all uneven periods). Now discounting is introduced. When the time between offers is of length z and parties apply the (for simplicity only symmetric) discount rate $r > 0$, this yields a per-period discount factor of $\delta = e^{-rz}$. Note that when there is now an impasse, which again will only happen out of equilibrium, then the length of this is given by z, as players will from then on come to an agreement in the next period (i.e. as this is the unique equilibrium of the so-called continuation game). When z goes to zero, so that there is no longer a first-mover advantage in $t = 0$, note that even when there is (off-equilibrium) disagreement, this lasts only for an infinitely small time. Still, this does not at all reduce the relevance of inside options, as is shown next. Suppose that the two parties can realise a (flow) payoff (profit) during disagreement of d_{PMI} and d_H, respectively. As $z \to 0$, the following result holds:[166] there is an immediate agreement, in which a transfer is determined so that H realises a (flow) payoff that is equal to the value of the inside option d_H plus one half of the respective net surplus $(S - d_H - d_{PMI})$. For the PMI, its payoff is the value of his

[163]This is also recognised in the more applied literature such as in labour economics (cf. for an analysis of various options during disagreement Moene 1988).

[164] What this discussion also highlights is the extreme assumption that underlies the OOP, namely that, in that framework, outside options must be taken (or not taken) in an "all-or-nothing" fashion. Instead, as the present discussion shows, once this is replaced by a the more gradual approach through the consideration of inside options, the respective payoffs always matter for the resulting bargaining outcome.

[165]Inside options are treated explicitly in the textbook on bargaining Muthoo (1999) (see also the short exposition in Muthoo 2001).

[166]Precisely, one can show that the unique subgame perfect equilibrium outcome of this alternating-offer, infinite horizon bargaining converges to the respective result.

inside option d_{PMI} plus again one half of its net surplus.[167] As observed above, this corresponds to the application of the axiomatic Nash bargaining solution, albeit now with the (stationary) values of the inside option replacing the outside option values. (Note that in the presently described simple set-up no such outside options are explicitly considered; see however the next paragraph.) In particular, note also that the issue of credibility (as stressed by the OOP) no longer arises.

3.61 A key feature of the model presented in this Appendix is that inside options *together* with outside options determine the distribution of bargaining power. The preceding discussion showed how both practical considerations as well as more general theoretical modelling support the inclusion of both inside and outside option.

3.62 Note also that while the simple two-period model presented in this Appendix is basically silent on the (off-equilibrium) duration of a temporary impasse (that is, in "real time"), the preceding discussion showed that inside options matter even when once there is disagreement, in the continuation game an agreement is reached almost immediately. In fact, this does not reduce the importance of inside options at all.[168]

3.63 Recall finally that in the literature outside options are often introduced by allowing for an exogenous breakdown in each round during which there is no agreement yet. The combination of such a breakdown of negotiations with the previously discussed inside-option approach would, now with an open time horizon and potentially an alternating-offer bargaining model, deliver an outcome in which both inside options (i.e. the profits that are realised when only temporary adjustments are made) and outside options (i.e. the profits that are realised when there is a complete switch away from the present trading partner) matter, exactly as in the simplified model that is analysed in this Appendix.

[167] For a formal proof, which is analogous to that in the classical contribution of Rubinstein (1982), see Muthoo (1999). Note again that the respective values (of the surplus as well as of the inside options) are "flow payoffs" (in continuous time). For instance, if s is enjoyed from now on indefinitely, then the respective discounted value is $\frac{s}{r}$.

[168] The preceding discussion also showed how instead of assuming an "all-or-nothing" choice for an outside option, which would then by assumption trigger permanent breakdown of negotiations, the respective payoff (profit) can also be interpreted as arising from continued disagreement. Again, such an approach ensures that these options always matter.

Annex 2: Formal Derivations

3.64 In this Annex the two-stage bargaining game is solved through backwards induction. Start therefore at the final period at which offers are made, $t = 1$. Recall that either party is chosen with positive probability to make an offer, precisely H with probability β and the PMI with probability $1 - \beta$. In equilibrium, the respective receiver will then obtain just the profits that he would realise under the outside option. As long as the net surplus, which we derive below, is strictly higher than the sum of outside options, there will be agreement with probability one. Note that two possibly different weights can now be used for the two periods over which payoffs are realised in the model. Without loss of generality, suppose that the first period receives weight 1 and the second period weight γ, where the only restriction is that this is strictly positive as well. Hence, the following expressions are obtained for the more general case where, first, the probability with which either side is chosen as the proposer can differ (β vs. $1 - \beta$) and where, second, periods can have different weights (1 vs. γ). The expressions in the main text were instead simplified by taking only the symmetric case (with $\beta = \frac{1}{2}$ and $\gamma = 1$).

3.65 At $t = 1$ the value of the outside options are then given for H by
$\gamma[q_D(p_0 - c) - F]$

3.66 and for the PMI by
$\gamma\alpha_D(\pi - q^*p_0)$.

3.67 Note that the outside option for the PMI takes into account the following two adjustments compared to profits under an agreement with H. First, the whole business is scaled down by the factor α_D. This scaling applies both to the quantity of services, q^*, and total revenues π. (Recall that under an agreement profits would be equal to π minus the payment that must then be made to H.) The second adjustment is then immediate, as the adjusted volume of services $\alpha_D q^*$ must now be procured from other sources at price p_0. Regarding the outside option of H, recall that after breakdown of negotiations with the PMI, only the quantity q_D of services is sold. This reduces the respective variable costs, but leaves fixed costs F constant.

3.68 When there is agreement, the two parties together realise instead profits
$\gamma[\pi + p_0q_0 - F - (q_0 + q^*)c]$.

3.69 This takes into account the services q^* sold through the PMI and the services q_0 sold through other channels.

3.70 Hence, at this stage the net surplus from an agreement is the difference between joint profits and the two outside options, that is:
$\gamma[(\pi - q^*c) - \alpha_D(\pi - q^*p_0) - (p_0 - c)(q_D - q_0)]$.

3.71 This is supposed to be strictly positive as, otherwise, there would not be scope for a mutual beneficial agreement at this stage.[169]

[169] For the purpose of this Annex, as noted above, one can remain agnostic about the size of p_0, in particular. The net surplus increases with p_0 when $\alpha_D q^* \geq q_D - q_0$, while it otherwise decreases.

3.72 At the beginning of $t = 1$, recall that either side is chosen with positive probability to make a take-it-or-leave-it offer. Hence, at this stage the expected profits of either party are given as follows. For the PMI, the expected profits are equal to its outside option value with probability β (i.e. when the PMI is chosen as responder), while with probability $1 - \beta$ the PMI extracts the full net surplus (i.e. when the PMI is chosen as proposer). That is, the expected profits of the PMI are, after some manipulation, equal to

$$v_{PMI} = \gamma\alpha_D(\pi - q^*p_0) + (1-\beta)\gamma[(\pi - q^*c) - \alpha_D(\pi - q^*p_0) - (p_0 - c)(q_D - q_0)]. \quad (3)$$

3.73 When $\beta = \frac{1}{2}$ this simplifies further to

$$\gamma\frac{1}{2[(\pi - q^*c) + \alpha_D(\pi - q^*p_0) - (p_0 - c)(q_D - q_0)]}.$$

3.74 Turn now to H. Its outside option profits are, by the same logic, equal to

$$v_H = \gamma[q_D(p_0 - c) - F] + \beta\gamma[(\pi - q^*c) - \alpha_D(\pi - q^*p_0) - (p_0 - c)(q_D - q_0)]. \quad (4)$$

3.75 For $\beta = \frac{1}{2}$ this again simplifies to

$$\gamma\left[\frac{1}{2[(\pi - q^*c) - \alpha_D(\pi - q^*p_0) + (q_0 + q_D)(p_0 - c)]} - F\right].$$

3.76 Turn now to period $t = 0$. Recall that again either side is chosen with positive probability to make an offer. By optimality the offer reduces the respondent's expected profits to just the profits from a rejection. When there is temporary disagreement following a rejection, the profits are equal to the inside option resulting from the per-period profits at $t = 0$ plus the expected continuation profits at $t = 1$ that were derived above (that is, v_H and v_{PMI} respectively). Hence, the offer that a proposer makes must compensate the receiver both for the foregone profits from the inside option over the next period and for the expected future profits. The (minimum) profits for the PMI, which the PMI secures when in the role of the respondent, are thus

$$\alpha_d(\pi - q^*p_0) + v_{PMI}.$$

3.77 Recall that α_d is the share of retained business, which scales down the PMI's total revenues, while services must then be procured at the price of p_0. The (minimum) profits for H, when in the role of the respondent, are

$$[q_d(p_0 - c) - F] + v_H.$$

3.78 Recall that H can adjust capacity usage to q_d, while services are then sold at price p_0. Note also that at this stage the net surplus from an agreement is, in anticipation that otherwise there will be an agreement in $t = 1$,

$$(\pi - q^*c) - \alpha_d(\pi - q^*p_0) - (p_0 - c)(q_d - q_0).$$

3.79 The proposer can extract this value minus the just derived minimum profits of the respective responder. This can now be used to finally determine the expected equilibrium profits for either side.

This reflects the dual role of p_0 as the price for H's services when sold through other channels and as the price at which the PMI can procure these services at other hospital operators.

3.80 At this stage it is also useful to note that the total gross surplus of the two sides when coming to an immediate agreement is given by

$$(1+\gamma)[\pi + q_0 p_0 - (q_0 + q^*)c - F].$$

3.81 Recall for this that under an agreement with the PMI the private healthcare provider sells the total service volume $q_0 + q^*$, which may or may not be equal to total capacity $\bar{Q}$. To sum up all business, the total weight factor $(1+\gamma)$ is applied.

3.82 Take now first the case of the PMI. The PMI expects to be chosen as proposer in the first period with probability $1-\beta$. With probability β he will have to respond to H's offer instead. Consequently, from an ex ante perspective the PMI's expected profits are

$$u_{PMI} = \beta[\alpha_d(\pi - q^* p_0) + v_{PMI}]$$

$$+(1-\beta)\begin{bmatrix}(1+\gamma)[\pi + q_0 p_0 - (q_0 + q^*)c - F] \\ -[[q_d(p_0 - c) - F] + v_H]\end{bmatrix}.$$

3.83 Again recall that the first term captures the case where the PMI is chosen as responder and the second term the case where, as a proposer, the PMI can extract the difference between the total surplus and the minimum profits that it must grant H to ensure acceptance of the offer. When $\beta = \frac{1}{2}$, as in the main text of this Appendix, this becomes

$$u_{PMI} = \frac{1}{2}\begin{bmatrix}(1+\gamma)[\pi + q_0 p_0 - (q_0 + q^*)c] \\ +(\pi - q^* p_0)(\alpha_d + \gamma\alpha_D) \\ -(p_0 - c)(q_d + \gamma q_D)\end{bmatrix}.$$

3.84 Proceeding likewise for H, again for $\beta = \frac{1}{2}$, one obtains

$$u_H = \frac{1}{2}\begin{bmatrix}(1+\gamma)[\pi + q_0 p_0 - (q_0 + q^*)c] \\ +(p_0 - c)(q_d + \gamma q_D) \\ -(\pi - q^* p_0)(\alpha_d + \gamma\alpha_D)\end{bmatrix} - (1+\gamma)F.$$

3.85 When $\gamma = 1$, these expressions for u_{PMI} and u_H transform to the respective expressions used in the main text.

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4. APPENDIX 4: ANALYSIS OF INSURED PRICES

INTRODUCTION

4.1 As part of the CC's assessment of the bargaining power of hospital operators in negotiations with PMIs the CC conducted an analysis of "insured prices", looking at the amounts charged by hospital operators to the various PMIs. The CC suggested that its various analyses can provide a *"useful insight"* into the extent of any market power held by hospital operators in negotiations with PMIs and the degree of buyer power held by PMIs.[170] HCA strongly contends that this is not the case. The CC's analyses considered:

- the average revenue per admission (calculated for each insurer and across all insured patients);
- a national "insured price index" for a common basket of treatments for all operators (calculated for each insurer);
- a London "price index" for a common basket of treatments for HCA and TLC (calculated for each insurer); and
- an "insured price index" for a common basket of treatments across PMIs and self-pay patients for each hospital operator individually.

4.2 The CC additionally conducted an analysis of the drivers of insured prices, although HCA was not included in this analysis. HCA does not comment on this analysis in this response although highlights that this should not be interpreted as it agreeing with the CC's position on the drivers of insured prices.

4.3 The CC itself acknowledged that, *"comparing insured prices is not a straightforward task"*[171] and HCA considers that the difficulties the CC faced are apparent in its analysis which failed to deal with the complexities of the negotiations between PMIs and hospital operators, and of private healthcare more generally. In this Appendix HCA sets out its detailed views on the CC's insured price analysis. As set out in this section HCA submits that:

- the CC's analysis did not measure "prices" and biases upwards the value of indices for HCA;
- the CC's analysis is not informative of HCA's bargaining power because of its failure to take account of the quality and other cost differences between hospital operators;
- the CC's analysis is not robust due to a number of serious methodological issues; and
- the results of the CC's analysis do not support its provisional findings.

[170] CC, PFs, Appendix 6.12, para. 3.
[171] CC, PFs, Appendix 6.12, para. 4.

(1) THE CC'S ANALYSIS DID NOT MEASURE PRICES

4.4 The CC stated that its insured price analyses *"can provide a useful insight into the degree of any market power held by hospital operators in negotiations with PMIs"*.[172] HCA strongly contends that the basic premise of this statement is incorrect. As HCA explains below, it considers that the CC did not properly measure prices, and therefore cannot be said to have conducted a "price analysis". Instead, the CC analysed episode charges. Therefore, HCA submits that the CC's insured price analysis cannot be used as part of a bargaining power assessment because:

- The CC analysed episode charges rather than price and the considerable variation in values confirms the importance of this difference;
- The CC failed to control for complexity of cases across the treatment procedures (CCSDs) and the provision of treatments in different episode settings (inpatient, outpatient and daypatient) which explains some of the episode charge variation observed;
- The CC did not take account of patient specific factors, such as co-morbidities, affecting the complexity of cases within CCSDs, treatment requirements and hence episode charges; and
- There are clear examples demonstrating that the CC did not conduct a like for like assessment across hospital operators.

4.5 HCA further submits that the CC's statement is incorrect as even if it had conducted a price analysis it failed to take account of key features of the supply of private healthcare which influence cost, so the analysis provides no insight into market power. This issue is addressed in section 2 of this Appendix. Methodological issues with the analysis which also render it ineffective in providing insights into market power are addressed in section 3.

The CC analysed episode charges rather than price

4.6 The CC constructed a number of price indices in order to attempt to assess the prices charged to PMIs for a common basket of treatment across hospital operators. The insured price index was calculated by the CC using the following steps:[173]

- Identify the basket of treatments that are purchased by a given PMI from all hospital operators in the analysis;
- For each treatment in the basket, calculate the average price per episode (i.e. patient visit) charged by each hospital operator to the PMI;
- For each treatment in the basket, calculate the hypothetical expenditure the PMI would face if it were to purchase all its requirements for this treatment (given by the total volume of patients insured by that PMI who received the treatment) from one hospital operator at the average price charged by that hospital operator to the PMI;
- Sum the hypothetical expenditure the PMI would incur if it were to purchase all the treatments in the basket from one hospital operator to produce a total hypothetical expenditure for the basket; and

[172] CC, PFs, Appendix 6.12, para. 3.
[173] See para. 12 of Appendix 6.12 to the CC's Provisional Findings for a more detailed description.

- Index the total hypothetical expenditure at one hospital operator's prices relative to the PMI's actual expenditure on the basket of treatments at the different prices charged by different hospital operators.

4.7 The CC used this approach to calculate a national price index on common baskets of treatments offered by all of the large hospital operators to each insurer; and a London price index comprising the common baskets of treatments offered by HCA and TLC to each insurer. It used this approach in an attempt to compare the prices charged by each hospital operator to each insurer for different treatments on a more like for like basis. However, HCA submits that the analysis does not allow a like for like comparison to be made. Indeed, this type of analysis is not a meaningful measure that either HCA or the PMIs use to attempt to compare prices, for example in the context of contract negotiations.

4.8 The CC's indices are not actually built on prices for an individual procedure (CCSD) or, in aggregate, on the prices of a basket of treatments. Instead it is based on the weighted revenues received by HCA from PMIs for individual patient episodes across the basket of CCSDs analysed. The "prices" the CC observes are for the entire episode. As the CC explained, it *"tried to capture all charges associated with an episode of treatment – i.e. all charges from when the patient is admitted in a hospital for a treatment until when the patient is discharged"*.[174] This shows that each individual episode, therefore, comprises a bundle of services provided by the hospital operator – not only the procedure itself (captured by the CCSD) but also the range and number of additional services provided including drugs, medical consumables (such as dressings), diagnostic and imaging tests, nursing care and the bed for the length of stay.

4.9 The way in which different hospital operators record, and invoice for, the range of services provided, including pre-assessment and post-operative care will impact the episode revenues analysed. Also, as the services provided to each patient will differ even for the same CCSD, the CC is simply not comparing like for like when looking at the average prices charged across hospital operators for a given CCSD. Factors such as complexity of cases, episode setting (inpatient, daypatient or outpatient) and patient characteristics, as HCA explains in paragraphs 4.14−4.26 below, will be a driver of this. Furthermore, the data issues which HCA has identified and discusses in sub-section (2) will further exacerbate the problems of using episode charges.

4.10 Indeed, the considerable variation in the episode charges within CCSDs in the data confirm that it cannot be seen as a real "price" analysis. Whilst in the CC Dataroom, HCA's advisers reviewed the revised Healthcode data used in the CC's analysis and specifically the episode charges (which as noted above the CC incorrectly used as prices) across hospital operators for CCSDs within the baskets used for the CC's price indices. The review demonstrated that there was considerable variation in episode charges across CCSDs for all operators. On average, *[redacted]* of treatments had variation in episode charges of over *[redacted]*. For some operators and CCSDs, the difference was higher than 20,000%. There is more variation across some operators than others.

4.11 The episode charge variation for a number of specific CCSDs included within different price index baskets for 2011 are shown in the figures below. The y-axis (each figure with different ranges) shows the variation in episode charges for HCA and TLC for the same CCSD in 2011 with the average episode charge shown in red. This variation observed for the same

[174] CC, PFs, Appendix 6(12), footnote 5.

CCSDs in the same year clearly shows that the data used cannot reflect the "price" negotiated with PMIs. HCA explains the drivers of episode price variation from a clinical perspective in paragraphs 4.27−4.29.

Figure A4.1: Episode charge variation between HCA and TLC for G6500, XR180 and XR915 and between HCA and BMI for K6510, 2011

[redacted]

4.12 This considerable variation in charges is important. If these differences could really be interpreted as differences in prices across episodes for the same CCSD (and hence across operators) the CC would need to produce a rationale for these differences. How could "prices" vary so much? Are there significant differences in costs for each treatment episode? Or are these differences driven by changes in bargaining power? The latter explanation clearly cannot account for the scale of differences for episode charges for the same CCSD in the same year. As to the former (differences in costs) the CC does not control for this in its analysis.

4.13 HCA's advisers submit that the correct interpretation of these figures is, of course, that these differences are driven by different complexity of cases, bundle of services provided etc. In other words, these figures (and the indices built on them) are in fact "revenue" figures. As explained below, the episode charges and "price" indices as used by the CC are not informative on relative bargaining power between operators.

The CC's failed to account for the complexity of cases across the treatment categories (CCSDs) and the provision of treatments in different episode settings[175]

4.14 HCA contends that the CC's failure to take account of the complexity of cases provided by each hospital operator, reflected in both the range and type of treatments provided and the mix of inpatient, daycase and outpatient care, is a serious flaw in its analysis. Complexity is a key driver of the variation observed in the episode charges used in the analyses, and therefore affects both the average revenue per admission measure and the price indices.

4.15 The CC correctly noted that a hospital operator may offer a different treatment mix from its rivals.[176] For example, a hospital operator may undertake a greater proportion of "tertiary" or complex cases, or conduct a different proportion of outpatient / daycase / inpatient treatments compared to a rival operator. Such differences in the treatment mix across hospital operators affect the respective costs of delivering care faced by each operator, and, in turn, the price measures considered by the CC: the average revenue per admission and the insured price indices (both the national price index and the index comparing HCA and TLC).

4.16 As explained in section 3 of HCA's Response to the CC's PFs, HCA's strategy has been to focus in the more complex high acuity specialities and treatments. As such, its treatment mix is very different to that of other hospital operators. Indeed, the CC noted itself that HCA

[175] By episode settings HCA refers to patient episodes in either inpatient, daypatient or outpatient settings.
[176] See paragraph 12 of the CC's working paper "Empirical Analysis methodology of price outcomes in negotiations between hospital operators and insurers".

is, *"the largest provider of tertiary treatments by revenue in Greater London. HCA also earns the highest proportion of its total revenue from this group of treatments".*[177]

4.17 Higher acuity cases may involve the use of more sophisticated treatment technology, a lengthier inpatient admission period, the use of critical care support, higher levels of patient monitoring and so forth. In light of this activity focus, an operator such as HCA operating in a competitive market would be reasonably expected to generate higher episode revenue per admission. However, the average revenue measure (as CC acknowledges) does not, in any way, control for treatment mix. This is one of the reasons why the measures produced with this analysis are likely to result in greater values of the indices being associated with HCA.

4.18 Moreover, the CC's analysis does not even take into account the different mix of inpatient and day case treatments of each hospital operator. Clearly the episode charges data used by the CC for its analysis will be affected by the number of patients treated as inpatients and daypatients. HCA's advisers report results considering inpatient episodes only (which allows a more like for like comparison between hospital operators) in relation to the London price index in section (4). The figure below shows how, compared with other hospital operators, HCA consistently has a greater proportion of inpatient episodes, and, correspondingly, a greater proportion of inpatient revenues.

Figure A4.2: Proportion of hospital operator revenues (rev) and episodes (eps) accounted for by inpatients (inp), by PMI, 2011

Source: HCA analysis

The CC did not take account of patient specific factors affecting the complexity of cases within CCSDs, treatment requirements and hence episode charges

4.19 Even where the CC attempted to control for different treatments offered by the different hospital operators by taking a common basket of treatments in its price index analyses, it does not take account of varying complexity of cases across operators within the treatments (CCSDs) considered. Complexity is important in explaining the variation in episode charges seen in the Healthcode data, which HCA commented on above.

4.20 CCSDs are a blunt tool for categorising treatment procedures. They fail to capture differences in co-morbidities and other patient characteristics. HCA's greater focus on higher-acuity medical cases means that the patient episodes that occur in its hospitals are likely to be of a more complex nature even where the CCSD code for the treatment is the same as other hospital operators. This is not captured within the CCSD though and the CC's analysis incorrectly presented patients undergoing the same CCSD as homogenous.

4.21 Patients admitted for treatment can exhibit widely different characteristics and this will ultimately affect the complexity and the cost of the treatment received. For example, the age of a patient, the severity and/or progression of their illness and any complications arising out of the patient's medical history (e.g. the existence of co-morbidities or previous/existing medical treatments) or in the treatment the patient was admitted for will differ. A patient's preferences and post-treatment lifestyle expectations may also influence the type of treatment and the medical consumables (such as prosthesis) required. All of these factors

[177] See para. 58 of the CC's paper on private healthcare in central London: horizontal competitive constraints.

influence the type of care provided, and, as a corollary, the associated cost of treatment. HCA previously submitted three case studies demonstrating the relevance of this point.[178]

4.22 Greater complexity may manifest itself in a range of factors that increase the cost of care, such as the use of more advanced technologies for treatment, lengthier admissions, critical care support, higher pathology charges or a greater utilisation of high-cost consumables. The CC, inappropriately in HCA's opinion, did not take any such factors into account in either its analysis or the interpretation of its results.

4.23 The differences in cost arising as a result of the specific treatment requirements of individual patients will be reflected in the episode charges invoiced to PMIs. Not only will the contract prices agreed with PMIs reflect the complexity of HCA's cases in general but this will also be reflected in the charges for each individual patient. The level of complexity even within a CSSD will affect episode charge outcomes. As noted previously, the CC highlighted that, *"to ensure that our [CC's] price comparison between hospital operators is consistent, we [the CC] tried to capture all charges associated with an episode of treatment – i.e. all charges from when the patient is admitted in a hospital for a treatment until when the patient is discharged"*.[179] The "prices" (episode charges) used in the analysis, therefore, will vary considerably based on the complexity of the treatment requirements for each individual patient. Indeed, as shown above in Figure A4.1 this considerable variation in episode charges is observed.

4.24 HCA submits that it deals with more complex cases than other hospital operators and this will clearly be reflected in the episode charges used by the CC in its analysis, leading to higher value of the indices for HCA.

4.25 HCA notes that the CC recognised the importance of controlling for the complexity of cases and quality in its PCA. It introduced a control variable (CCL3) to reflect a hospital operator's provision of critical care level 3 beds, the provision of which, it accepted, may be associated with differences in case mix as well as quality.[180] Furthermore, in the CC's insured pricing analysis the CC itself acknowledged that the data on the charges for treatments recorded by hospital operators might contain cost elements that are linked to patient-specific characteristics.[181] However, despite this, the CC failed to include any controls in its analysis of "insured prices" and did not take account of this flaw in its interpretation of the results.

4.26 HCA strongly contends that for the CC to take a different view in relation to the importance of complexity and quality in the context of the insured price analysis is a clear inconsistency in the CC's approach. Specifically, the CC must either control for different complexity and other drivers of differences in episode charges, or accept that its analysis cannot be informative of relative bargaining power. It has to also recognise that failure to control for these factors will necessarily bias the results and do so in a way that inflates the value of the indices for HCA.

[178] See Annex 1 of HCA's Response to CC in relation to Data Room exercise and the CC's Working Paper: Price concentration analysis for self-pay patients, May 2013.
[179] CC, PFs, Appendix 6(12) footnote 5.
[180] CC, PFs, Appendix 6(9), para. 33(a).
[181] See footnote 5 to para. 10 of Appendix 6.12 to the CC's Provisional Findings.

There are clear additional clinical reasons why analysing episode charges does not allow the CC to conduct a like for like assessment across hospital operators

4.27 There are a number of clear clinical explanations for the variation in episode charges observed in the data. The CC did not appear to explore why there may be episode charge variation from a medical perspective, instead seeking to attribute the difference observed in the overall indices to bargaining power.

4.28 Given that a limited number of individuals at HCA were able to review the basket of treatments used in the CC's analyses, these individuals were able to provide clinical explanations for why one might observe episode charge variations. Furthermore, given that the CC provided HCA with the HCA Healthcode invoice data used for its analysis HCA was able to check individual patient invoices to understand the entire basket of service provided as part of the episode. Given time constraints it was not possible to do this for all patient invoices or indeed for all treatments included in the CC's price indices baskets. However, some pertinent examples of how episode charge variation can be explained from a clinical perspective are set out below:[182]

- Cardiac catheterisation (K6510) is a diagnostic procedure which frequently turns into a therapeutic installation of a stent so that the procedure becomes an angioplasty (which in itself can cause coding issues). On less frequent occasions, patients undergoing cardiac catherisation have heart attacks which require open heart surgery. The vast majority of K6510 procedures are completed as a daycase [✂] and [✂] of patients undergoing this procedure have a maximum two night stay. However, in cases where complexities arise, significantly longer lengths of stay are required with consequently major cost increases. This can explain the variation in the episode charges invoiced to PMIs. HCA further notes that hospitals such as HCA's Wellington, Harley Street Clinic and London Bridge all undertake cardiac surgery and are therefore likely to attract the patients at greater risk of more frequently requiring more complex treatment, longer stays and therefore higher charges.

  Ultrasound guided drainage of fluids (XR180) is a procedure which can vary significantly across patients in terms of complexity and ongoing treatment requirements. Draining fluid from a small cyst, for example, is a very different procedure to draining fluid from a patient's lungs, yet because CCSD coding is a blunt instrument they could both be categorised the same (as XR180). Furthermore, having analysed the CC's Healthcode invoice data provided to HCA, it appears that whilst the CC removed from its analysis any episodes involving multiple procedures (CCSDs)[183] it did not remove episodes where a patient had been treated for the same procedure multiple times as part of one episode. For example, the patient with account number [✂], underwent ultrasound guided drainage of fluids as part of one episode on a number of dates as shown in the invoice printout below:

  [✂]

- The procedure involving insertion of a central venous catheter – tunnelled (x-ray guided) (XR915) varies in episode charge by as much as [✂] (for those episodes included in the 2011 London price index basket for Bupa and AXA). Having reviewed a number of the

[182] The episode price variations for these CCSDs for HCA were shown in Figure A4.1 above.
[183] CC, PFs, Appendix 6.12, footnote 8.

patient records and invoices where this was the sole procedure, HCA has identified that the variation in episode charge, even across daypatient episodes, results from differences in the additional services required, particularly pathology services, the consumables used and also the administration of different medications such as Avastin, Oxaciplatin and Fluorouracil.

- Diagnostic oesophago-gastro-duodenoscopy (OGD) including forceps biopsy, biopsy urease test and dye spray (G6500) is a procedure that is generally used to diagnose and/or treat medical conditions. This can vary in complexity both in terms of the procedure and the length of stay and additional services required, such as drugs and other medical consumables Using this procedure to treat conditions such as bleeding ulcer or veins; widening of the oesophagus; providing nutrition; or removing polyps or cancerous tumours are generally more complex than when the procedure is used for diagnostic purposes only, and therefore, are likely to involve higher episode charges.

4.29 The CC's analysis in no way accounts for the variation in episode charges arising from the different medical requirements of each individual patient. It is clear that medical insight and/or understanding of individual patient records and invoices can be used to understand the episode charge variation. HCA strongly submits that there are clear medical reasons for the episode prices charged which mean that the CC is not assessing like for like across hospital operators. As explained previously, given that HCA focuses on the high quality provision of high acuity, complex care it considers that, in general, it treats more complex and difficult cases than other hospital operators. As noted above, it considers that this necessarily biases the results and does so in a way that inflates the value of the indices for HCA.

(2) THE CC'S ANALYSIS IS NOT INFORMATIVE OF HCA'S BARGAINING POWER BECAUSE OF ITS FAILURE TO CONSIDER QUALITY AND COSTS

4.30 As HCA highlighted to the CC in its response to the Market Questionnaire,[184] there are a number of specific features of the private healthcare market that have an impact on prices charged to PMIs. These include a hospital operator's quality and investments, which, for example, affect specialist clinical and nursing staff costs. Hospital-specific characteristics which affect costs, such as location of facilities and tax status, are also taken into account. The charges negotiated with PMIs necessarily reflect these factors, given that they can significantly affect the cost of providing healthcare to PMI patients.

4.31 In this section HCA explains why the CC's analysis cannot be used as the basis for any conclusion on HCA's bargaining power vis-a-vis the PMIs or relative to other hospital operators. The reason for this is that the CC failed to take account of key features of the private healthcare market in its analysis. These factors, affecting both value and costs (and hence charges to PMIs), include:

- Quality differentials between hospital operators; and
- Other hospital operator characteristics such as location and tax status.

4.32 The CC also failed to take account of key features of contract negotiations between PMIs and hospital operators, including rebates and the operation of restricted networks.

[184] See the response to question 28 in HCA's response to the Market Questionnaire.

4.33 HCA strongly considers that each of the issues set out above is significant individually; therefore, the collective impact of ignoring these crucial factors severely affects the reliability of the CC's results. Indeed, HCA notes that the CC itself acknowledged that, *"our [the CC's] price measures do not fully control for differences in the mix and the analysis does not control for all factors that influence negotiations"*[185] yet it does not appear to have taken this into account in interpreting the results it obtained or to have acknowledged that the differentials in the index observed are likely to be driven by these factors.

4.34 Without accounting for quality and costs the CC, even leaving aside the complexities described above, could not conclude on who has more bargaining power than whom on the basis of the data and its analysis. It is not in a position to consider from the analysis on the margins earned over services that have very different costs, and ultimately is unable to take a view on the relative value for money of the patient episodes it is comparing the charges for.

4.35 HCA sets out below how each of the features of the market affects the costs it incurs and hence charges to PMIs. It also explains why the failure to account for these means that CC's analysis is fundamentally flawed.

The CC failed to acknowledge the impact of quality differentials across hospital operators on its insured price measures

4.36 HCA has highlighted throughout its response to the PFs, the CC has incorrectly failed to recognise the significance of quality, innovation and investment in the supply of private healthcare and the key role competition plays in driving this. The insured price analysis is another key example of where the CC has overlooked this crucial factor. As explained in section 3 of HCA's response to the CC's PFs, HCA competes vigorously with other hospital operators on quality. Quality of care manifests itself in a number of ways, including quality of treatment, quality of facility and the availability of new and innovative treatments that result in enhanced patient outcomes. Hospital operators differ in terms of the investments they make in their facilities, staff and treatment technologies, all of which influences the quality of care. In this regard, in a competitive market one would expect to see price differentials reflecting both the different cost of provision for different levels of quality and the different value of services provided depending on the level of quality.

4.37 HCA has invested significantly in new and innovative treatments and technologies in order to differentiate itself and attract patients. As discussed in section 3 and shown in Appendix 6 of its response to the PFs, HCA has been a market leader in many new treatments and technologies and its capital expenditure is higher than other operators. HCA submits that the level of quality care it provides has an impact on the cost of treatment and, consequently, on its value and price. As an example, HCA has invested substantially in the cardiac speciality in order to be able to provide full service cardiac care to its patients. Whilst TLC provides some cardiac procedures, it does not provide the same quality and range of treatments as HCA. As a result TLC may have to transfer patients out of its facilities if additional cardiac services are required that it cannot offer.

4.38 The CC, whilst acknowledging that, "*there will be some variation in quality between hospitals",*[186] dismissed the argument that quality is an important factor to take into account in its insured price analysis, stating, "*both within a hospital operator and between hospital*

[185] CC, PFs, para. 6.239.
[186] CC, PFs, paragraph 6.213.

operators, we have seen no evidence as to a consistent pattern; moreover, there are no comprehensive quality indicators or ways of linking quality and cost".[187, 188]

4.39 HCA strongly disagrees with the CC's view about the role of quality in this analysis. HCA places considerable emphasis on continuous investment in its hospitals and, to that end, reinvests its profits in its hospitals. This is done with the sole objective of raising the standards of care and patient outcomes at its hospitals above those of competitors in a highly competitive market. HCA has endeavoured to be a market leader in terms of innovation in order to maintain its competitive position and improve patient safety and outcomes. There are clear quality differences between hospital operators. Not only does HCA operate in the most costly area of the UK but it also operates high quality facilities which have benefited from higher levels of capital expenditure as a proportion of revenues (as shown in section 3 of HCA's response to the CC's PFs) compared to that of other hospital operators across the UK.

4.40 The CC is incorrect to consider that there is no evidence of the variation in quality between hospital operators. Whilst HCA accepts that measuring quality can be difficult in healthcare, that does not mean that quality increments do not exist, nor does it mean that consultants are incapable of determining working proxies for superior quality. Indeed, although statistically complex, speciality groups like the Society of Interventional Cardiologists have publicly available quality measures to which HCA's hospitals contribute. There are a number of other quality indicators available, including compliance rates with Care Quality Commission (CQC) clinical outcomes, unplanned returns to the operating theatre, mortality rates, speed of recovery, nurse to patient ratios and results from GP, consultant and patient surveys. Additional proxies for quality such as the availability of critical care facilities can also be used. As highlighted in section 3 and set out in detail in Appendix 2 of HCA's Response to the CC's Notice of Possible Remedies, HCA has a very strong quality record, for example:

- It is renowned for the high quality of its hospitals and staff, its clinical resources and its investment and use of innovative technology to deliver improved patient outcomes. This is recognised by PMIs, including AXA PPP who referred to HCA's hospitals as "elite";
- It has a strong performance in terms of lower mortality rates, higher survival rates and rates of success and faster treatment;
- It achieved a 100% compliance with all CQC clinical outcomes – the only private operator to do so;
- Unplanned returns to the operating theatre at HCA are more than 10 times lower than the national average; and,
- The results of HCA's 2012 patient surveys were a 99% patient approval rating and 99.6% respect and dignity rating.

[187] *Ibid.*

[188] HCA notes the view put forward by St. Anthony's Hospital, a London based hospital operator and competitor of HCA that is not a party to this investigation, which stated that "*the Competition Commission could have tried harder; a clear way of linking quality and cost is through nurse ratios … the whole issue of quality has not been considered by the Competition Commission. Yet its own reports state that quality of clinical care is what the patients wish to have"*.

4.41 Furthermore, the HCA Quality Report[189] demonstrates that there are a range of metrics that the CC could have considered to understand quality differentials between hospital operators to inform their insured price analysis and interpretation of the results obtained. However, it failed to do so.

4.42 Furthermore, the CC is incorrect to have dismissed the ability to link quality to costs.[190] There are links between levels of investments made by HCA and quality and patient safety and outcomes. In providing certain services and facilities in order to increase the quality of provision to patients, HCA directly incurs higher costs. For example:

- In offering complex specialities, such as paediatric cardiology, there is a need to employ highly trained, specialist clinical staff.
- HCA employs more resident medical officers (RMOs) than other private hospital operators. RMOs play a key role in providing "round-the-clock" high quality care to patients, for example, if the consultant is not immediately present, the RMO would be the designated resuscitation team leader in the event of cardiac arrest. RMOs work primarily with surgical inpatients, conducting regular ward rounds and ensuring that all patients are well cared for. Any significant changes in a patient's condition are reported to the consultant and their direction is followed in respect of further treatment.
- HCA employs more clinical nurse specialists (CNSs) than other private hospital operators.
- HCA has a high ratio of nurses to patients in order to ensure the highest quality care. It is well recognised that increased nurses per patient leads to better healthcare quality as well as higher costs.
- In the provision of critical care level 3 beds (both adult and paediatric beds), HCA incurs higher costs, not only associated with the initial investment but also the ongoing clinical staff costs. [✂].
- HCA has more operating theatre capacity which gives rise to greater theatre maintenance and operational costs.
- The operation of more sophisticated treatment technology requires highly trained staff to safely operate the equipment and assist the consultant to administer treatment.

4.43 The infrastructure HCA invests in means that it provides a higher quality and safer level of patient care, which both patients and consultants value. Whilst some of the infrastructure, such as critical care, is not needed by the majority of patients it is there as a safety net should anything go wrong and to that extent, higher costs would be expected for the entire cohort of patients due to this availability of care. The provision of this infrastructure avoids patients needing to be routinely transferred out by ambulance to the NHS and HCA's capability means it is able to take complex patients and provide a full service to all patients should the need arise.

[189] Appendix 2 of HCA's Response to the CC's Notice of Possible Remedies.
[190] CC, PFs, paragraph 6.213.

The CC failed to account for other characteristics of hospital operators which affect their costs bases

4.44 A range of hospital-specific factors, such as its location legal structure and general complexity of the care and patient safety levels it provides, affect the costs a hospital operator faces and hence also the prices it negotiates with PMIs and the episode charges it invoices. HCA considers that the CC has not sufficiently accounted for cost differences across hospital operators in the insured pricing analysis.

4.45 HCA has submitted to the CC[191] that being predominantly a London operator, it faces higher costs than other hospital operators that are located across the UK. Healthcare costs are significantly higher in London than in other parts of the UK. This is recognised across the NHS where NHS London operators receive higher levels of reimbursement, through the Market Focus Mechanism (MFF), than the national average. The London Trusts such as UCLH receive 25−30% higher reimbursement than the national average.

4.46 The CC correctly acknowledged that HCA, which has almost all its hospitals located in central London, might have a cost base which is markedly different from the cost base of the other large hospital operators that do not have a significant central London presence.[192] HCA submits that these cost differentials arise not only due to the higher input costs it faces being located in London but also as a result of the general complexity of patient cases it treats.[193] As noted above, achieving HCA's quality and patient safety performance also requires additional investments and levels of cost that other operators do not incur. However, two of the analyses that the CC conducted, namely the average revenue per admission and national price index, failed to take account of these factors which drive HCA's increased costs as a high quality London hospital operator. Indeed, the CC relied upon the results of these analyses to support its findings in relation to HCA's supposed market power and bargaining power over PMIs despite having recognised HCA's costs (and consequently prices) may be higher due to the London location of its hospitals. The implications of the CC's failure to account for costs differentials arising between hospital operators is discussed in relation to the results of the CC's analyses in sub-section (4) below.

4.47 Whilst the CC did conduct one analysis to attempt to control for cost differences in London through calculating a price index for HCA and TLC, HCA considers that this insufficiently controls for cost differences for a number of key reasons which HCA explains immediately below and also in reference to the CC's results for the London price index in sub-section (4).

4.48 Not only do hospital operators located outside of London have costs advantages over HCA, but HCA considers that a number of its competitors based in central London, including TLC, also have inherent cost advantages over it:

- NHS PPUs, who benefit from association with established NHS Trusts, can utilise otherwise costly infrastructure, such as critical care facilities, as part of their service offering without fully accounting for its cost. In addition, they can offer "unmatchable" employment terms to clinical staff, for example, relating to pension provision, which enable them to offer lower base salaries compared to independent operators.

[191] HCA, Response to CC Market Questionnaire, September 2012, paragraph 22.3
[192] See para. 20 of Appendix 6.12 to the CC's Provisional Findings.
[193] Patients choose to travel to London to access the more complex and higher quality care provided by HCA.

- Hospitals owned by charities can benefit from tax and equity-finance advantages. Analysis prepared by CASS Business School on behalf of HCA[194] estimated that the tax advantages of having a charitable status can be very significant. Taking the example of TLC, the paper estimated that in 2011 it saved £6.8 million through corporate tax and business rates relief and £3.1 million through VAT savings, representing around £10 million – a material proportion of TLC's 2011 turnover, £124 million. Furthermore, hospitals with charitable status also benefit from VAT savings on some of the investments made depending on their specific nature and whether they meet the HMRC VAT exemption rules. As noted throughout this submission HCA has made significant investments to provide the best quality of care and latest treatments and technologies. These investments are crucial given in the competitive market for UK and international patients. However, to the extent that any charitable competitors are able to make these investments at a lower cost than HCA due to the VAT savings, they would clearly have a cost advantage over HCA and this may be reflected in the prices they charge.

4.49 Whilst the CC acknowledged that certain operators, including TLC, benefit from tax advantages given their charitable status which, *"may be expected to have an impact on the cost base of these businesses",*[195] in its PFs, the CC dismissed HCA's argument that hospitals with a charitable status might have an advantage affecting their prices, stating that:

"To the extent that we [the CC] are comparing hospital operators that compete with each other, eg in central London, we would expect prices to be determined by the more efficient operator and would not expect that certain higher costs, for example due to tax disadvantages compared with operators with charitable status, would lead to higher prices in a competitive market".[196]

4.50 This statement is confused and incorrect. It is not clear on the basis of what model of competition the CC is forming its "expectation" of how prices would be determined. In the London market, as in most other markets, there are differences between the offer of different operators that relate to what in economics is referred to as the vertical and horizontal differentiation of their products. Further, there are differences in efficiencies of businesses and in their cost base. In such a context it is hard to think of a reason why the cost base would not matter in determining the price charged. Indeed, in a competitive market, this is precisely what would be expected. Having to pay lower taxes is a cost advantage for hospital operators with charitable status. Therefore, given the same level of efficiency, charitable hospitals might be able to charge lower prices than other hospital operators for certain treatment types, such as those considered by the CC.

4.51 Furthermore, it is a basic tenet of EU competition law, in the context of the control of state aids under Article 107, TFEU, that a subsidy (including tax subsidies) which provides a selective financial advantage to an undertaking in and of itself distorts competition by improving the recipient's financial position relative to its competitors. This is irrespective of whether the market is competitive or not – the subsidy itself makes the market less competitive by conferring a cost advantage on the recipient. The CC's argument, that in a competitive market higher costs should not lead to higher prices, is specious and wholly at variance with the relevant case law on subsidies.

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[194] This analysis was prepared by Pielle on behalf of HCA International and submitted to the CC in May 2013.
[195] CC, PFs. Para. 6.214.
[196] *Ibid.*

4.52 By not controlling for the charitable status in its analysis, particularly when it considers TLC as a comparator for HCA in central London, the CC missed an element that plays a relevant role in the competitive interactions between players. Indeed, as noted in the summary of TLC's hearing in with the CC, *"there were also some non-financial and financial benefits to being a charity: for example, TLC did not pay dividends or tax"* and *"one of the reasons that TLC did not charge the same price as HCA was because it was a charity".*[197] HCA does not agree that the price comparison with TLC allows the CC to understand whether price differences are driven by cost or bargaining power. Furthermore, even setting aside the cost savings TLC benefits from as a result of its charitable status, HCA incurs significant additional costs per admission due to the quality of service and wider range of treatments that it provides. HCA sets out its cost estimation of the impact of this in paragraph 4.104 below.

4.53 This analysis clearly demonstrates the cost differences across hospital operators which will then be reflected in the prices charged to PMIs. HCA strongly considers that the CC should have taken account of hospital specific characteristics which drive costs and price outcomes in the market when interpreting the results of its insured price analysis.

Key features of contract negotiations between PMIs and hospital operators were not taken into account by the CC, including rebates and restricted networks

4.54 In general, HCA negotiates charges (and other terms and conditions of contracts) with each PMI individually across the full spectrum of treatments provided to patients. Whilst HCA has made clear to the CC that it does not operate a "one in all in" policy for its portfolio of hospitals, it is the case that procedure charges are set, in general, at the same level across all its hospitals. There are notable exceptions, however, where the PMIs use their bargaining strength to secure further discounted prices for new facilities and/or treatments as a condition of recognition. [✂],[198] [✂].

4.55 The insured prices are the outcome of these bilateral contract negotiations with the PMIs across all HCA's hospitals. Contract negotiations are not conducted every year, although, as would be expected, in general an annual uplift to price is agreed within the contract terms and applied each year to reflect some of the cost-inflationary pressures in the periods between contract negotiations. HCA provided the CC with detailed information on the contracts it has in place with PMIs in response to the CC's Market Questionnaire.[199] [✂].

4.56 Whilst there are some individual treatments on which contract negotiations may focus in more detail in a specific round of negotiations with a PMI, in general, prices are negotiated across the full range of treatments.

4.57 Given this, there are likely to be certain treatments on which HCA makes a higher margin than others. Therefore, the price for an individual treatment (or for a small group of treatments) will not be informative of the relative bargaining strength of HCA vis-à-vis a PMI. It is the prices over the large majority of treatments (some approximately [✂] possible CCSDs in total in HCA's case in 2011[200]) that is of importance. HCA therefore submits that the comparison of the price of specific treatments across different hospital operators is

[197] CC, TLC Hearing Summary, paragraphs 6 and 16.
[198] [✂].
[199] HCA, Response to CC Market Questionnaire, September 2012, Section 5.
[200] Analysis based on HCA's patient database from 2009 to 2012 indicates that BUPA patients were treated for a minimum of 1,305 and a maximum of 1,387 different CCSDs.

unreliable. Indeed, the CC itself recognises this issue, when it notes that "*comparing the price of too small a number of treatments may lead to distorted results as the hospital operator may have higher or lower prices elsewhere*".[201]

4.58 HCA comments on the specific implications of the CC's comparison of too few treatments in its various analyses of price indices at paragraphs 4.75−4.93 below.

4.59 In addition to comparing prices over only a narrow subset of all the treatments HCA provides to PMI patients, the CC has failed to take into account other important contractual terms HCA has with some PMIs. As HCA highlighted to the CC in its response to the Market Questionnaire, expected patient volumes are a key competitive variable in negotiations with PMIs. HCA negotiates with insurers both on the basis of the current volume[202] of patients that the insurer has generated for HCA and the expected future volumes. This affects both the overall rates agreed as well as other price related contract terms. Specifically, some hospital operators (including HCA) and PMIs include "retroactive" rebates in their contractual arrangements. By only considering the amount invoiced per patient at the time of treatment, drawing on Healthcode data, the CC did not take account of the retroactive rebates paid to some PMIs by some operators, which are paid at the end of a set period (usually the end of the year) rather than applied on an invoice by invoice basis. These retroactive rebates affect the ultimate price paid, therefore the CC's insured price analysis using Healthcode data overestimates the effective price paid by insurers to some hospital operators.

4.60 In its PFs the CC dismissed this point arguing that "*Only three PMIs were paid rebates during this period and no PMI received a rebate in every single year. On the whole, the value of these rebates is small as a proportion of the total fees paid*". The CC also argued that it had replicated the insured revenue per admission analysis including retroactive rebates and it did not change the results.[203]

4.61 HCA notes, however, that it was not provided access to the results of the sensitivity analysis including retroactive rebates conducted by the CC as part of the CC's disclosure process. Nor was the data on rebates available in the CC dataroom to allow HCA's advisers to conduct the analysis. Therefore, HCA is unable to confirm whether the results are unchanged. Indeed, HCA does not agree with the CC's assessment of the relevance of rebates.

4.62 [✂].[204] [✂].

4.63 [✂][205] [✂].[206] [✂].

4.64 Given the evidence set out above in relation to the rebates HCA has in place in its own contracts with PMIs, it submits that the CC should take them into account in its analysis and certainly when interpreting the results of the analyses. This is particularly important for HCA given that the information presented by the CC in the PFs suggests that [✂].[207]

[201] See para. 4 of Appendix 6.12 to the CC's Provisional Findings.
[202] Aggregate revenue is generally used as a proxy for volume.
[203] See para. 6.209 of the CC's Provisional Findings.
[204] [✂].
[205] [✂].
[206] [✂].
[207] [✂].

(3) LACK OF ROBUSTNESS DUE TO KEY METHODOLOGICAL ISSUES WITH EACH OF THE CC'S INSURED PRICING ANALYSES

4.65 Notwithstanding the issues highlighted earlier in this Appendix around the CC not measuring prices appropriately and the key flaws in the CC's analysis due to a failure to control for costs and quality, HCA further submits that the CC's insured price analysis has a number of key methodological flaws. These alone render the results of its various analyses unreliable and certainly insufficient for conclusions in relation to market power of hospital operators and their relative bargaining strength compared to PMIs to be drawn. HCA sets out below methodological problems it has identified, specifically:

- The CC's analysis used flawed data containing invoicing inconsistencies across hospital operators and it faced difficulties itself in correctly cleaning the data;
- CCSD coding is imperfect;
- The common basket of treatments provided by HCA and TLC fails to capture HCA's treatment mix and for a number of PMIs is too small for a robust analysis;
- The common basket of treatments provided by all of the large hospital operators to each insurer is unrepresentative and fails to capture HCA's treatment mix; and
- The CC used incomplete data for PMIs, with insufficient data over the time period for some PMIs, other PMIs were completely omitted and some PMIs incorrectly grouped together.

4.66 HCA addresses each of these issues in turn in this section in relation to the specific analyses conducted by the CC. Given these issues, HCA urges the CC to consider more widely the robustness of its analysis and the weight it can place on any of the results due to the methodological flaws and data limitations HCA highlights below. HCA strongly submits that these issues, along with the failure of account for key aspects of the supply of private healthcare (as explained in sub-section (2) of this Appendix) mean that even if the CC had conducted a price analysis it cannot be used to measure relative bargaining power.

The CC's analysis used flawed data containing invoicing inconsistencies across hospital operators and it faced difficulties itself in correctly cleaning the data

4.67 HCA considers that the Healthcode data used by the CC for its analysis has a number of key flaws which clearly had an impact on the results obtained by the CC. Indeed, the CC itself acknowledged a number of the data flaws in footnotes to the text. It noted that it was, *"aware of the following issues: (a) some hospitals bundle pre- or post-operative treatments/tests in the same invoice while others may invoice separately at a later date; ...; (c) we are aware that there may be some errors in the data where hospital operators have billed an [sic] PMI more than once for the same procedure"*.[208]

4.68 Despite acknowledging, albeit in a footnote, these important problems with the data it used, it appears that the CC did not attempt to control for these and did not attempt to understand the results obtained in the light of these deficiencies. Even if HCA's data does not suffer from the issues identified, any flaws in the invoicing data for other operators to which HCA's prices are compared would impact on the results and conclusions that can be drawn from them. HCA highlights that the CC's disclosure process for the insured pricing analysis did

[208] See footnote 5, para. 10 of Appendix 6.12 to the CC's Provisional Findings.

not afford its advisers the opportunity to review the raw Healthcode data used by the CC for its analysis to understand the scale and impact of the flaws identified. HCA's advisers were only provided with the CC's cleaned data and the associated data cleaning STATA .do files.

4.69 HCA is particularly concerned by the use of the Healthcode data due to the potential scale of flaws and inconsistencies within it, given the problems the CC itself faced in using it. Ahead of the dataroom process, the CC informed HCA[209] that it had identified a number of issues with its cleaned Healthcode dataset which required a number of data revisions to be made. These included revisions to attempt to rectify the CC's incorrect:

- subtraction of all consultant fees;
- grouping of multiple invoice charges associated with a single patient episode;
- allocation of invoices to a year;
- consolidation of CCSDs.

4.70 These data revisions affected a number of key analyses conducted by the CC that it used to reach its provisional findings, including the insured price analysis, price concentration analysis and LOCI analysis (used to identify hospitals of potential concern). Given the sensitivity of the results to changes in the underlying data (for example, as a result of the data revisions the difference in the insured price index between HCA and TLC for Bupa in 2010 changed by *[redacted]*), HCA submits that the CC should be very careful about drawing any conclusions from this analysis, given the remaining significant issues with the underlying quality of the data. This issue is compounded by the other issues around the representativeness of the samples used for HCA discussed below. Indeed, HCA notes that the CC itself seemed to have ongoing concerns with the data as it was noted in relation to consultant fees that they had been subtracted from the revised data, *"as accurately as the data allows".*[210]

4.71 HCA notes that the HCA Healthcode invoice data that the CC provided it with, does not fully recognise approximately 1,000 records of the 107,000 included. There also appear to be some issues with the revenue figures in some cases where they do not appear to align with those recorded on HCA's systems. HCA is therefore concerned with the integrity and reliability of the data the CC used to conduct its analysis.

4.72 Furthermore, in terms of the TLC data used to construct the London price indices, HCA has particular concerns given that it notes TLC has data integrity problems which has held it back from joining the PHIN initiative to increase transparency on patient quality of care. HCA submits that this is likely to lead to issues with the London price index and the reliability of the results obtained given that it considers it likely that there may be issues with the quality of TLC data.

CCSD coding is imperfect

4.73 As HCA has explained, CCSD coding is a blunt instrument and there can easily be coding errors and inconsistencies in the way in which invoices are coded which lead to invoicing

[209] Letter from [✂], For the Treasury Solicitor, "BMI Healthcare Limited v Competition Commission (Case No. 1218/6/8/13)", dated 25 October 2013.
[210] Letter from [✂], For the Treasury Solicitor, "BMI Healthcare Limited v Competition Commission (Case No. 1218/6/8/13)", dated 25 October 2013, point 1.

issues. Codes "evolve" and in some cases the code is first registered as one procedure and then this changes because the procedure changes. HCA notes that it is common for consultants to change the procedure from the original intention in response to clinical requirements arising during the surgery itself. This can lead to CCSD coding disputes. Hospitals commonly code in the invoice based on what the consultant says is the planned procedure (and hence the booked procedure captured in HCA's booking system). However, consultants will tend to bill PMIs individually for their fees based on the actual procedure conducted given that that they have full knowledge of this. Where discrepancies arise, PMIs reimburse on the basis of the procedure the consultant actually performed. HCA estimates that coding misalignments of this nature affect approximately [✂] of invoices with Bupa. However, it should be noted that this is likely to be a very conservative estimate of the extent of coding misalignments given that PMIs have no incentive to highlight to HCA where the procedure it invoiced for was less costly than the actual procedure that was conducted according to the consultant's invoice.

4.74 As noted above, there is likely to be some variation in the procedures conducted even within a CCSD. HCA has identified that there are many instances in the HCA Healthcode data provided to it by the CC, and on which the CC relied for its analysis, where a single CCSD procedure was conducted multiple times on the same patient as part of one episode. This clearly becomes highly problematic where a CCSD code is present within the baskets used with by the CC in its analysis of episode charges across operators. For example, G6500[211] – present in the London price index basket for all PMIs in 2011 – is recorded five times in the Healthcode data as a single episode when the procedure itself was performed on a patient two or more times. Furthermore, procedure XR180 – present in the London price index baskets for AXA PPP and Bupa & Bupa International across all years during 2007−2011 – has 50 instances where this procedure was conducted on a patient several times within a single episode. HCA considers that the CC's failure to control for multiple occurrences of the same procedure within a single episode is a potentially serious flaw and provides further evidence as to the inappropriateness of using episode charges as a "price".

The common baskets of treatments provided by HCA and TLC fails to capture HCA's treatment mix and for a number of PMIs is too small for a robust analysis

4.75 The London price index calculated by the CC comprised a common basket of treatments offered by two operators only, HCA and the hospital operator which the CC judged its "closest competitor", TLC. HCA considers that the baskets of treatments used for the London price index analyses fail to sufficiently capture HCA's treatment mix and the full range of procedures it provides to PMI patients. Furthermore, for a number of PMIs the baskets are clearly too small for a robust analysis and for the price indices constructed to be meaningful.

Figure A4.3: Number of treatments and episodes in each PMIs basket– HCA and TLC, 2011

[✂]

[211] Diagnostic oesophago-gastro-duodenoscopy (OGD). Includes forceps biopsy, biopsy urease test and dye spray.

4.76 As already indicated to the CC[212], HCA agrees with the CC's view that the nature of price negotiations between the hospital operators and the PMIs, which do not generally focus on the price of individual treatments but relate to a group of services, renders the comparison of specific treatments across different hospital operators unreliable.[213] This issue is particularly acute when the number of treatments over which the comparison is made is small. Indeed this is a point that the CC itself acknowledged: *"comparing the price of too small a number of treatments may lead to distorted results as the hospital operator may have higher or lower prices elsewhere".*[214]

4.77 HCA strongly considers that these "distorted results" arise with the London price index, and in particular for the price indices results for the smaller insurers. HCA considers that in a number of cases the baskets of treatments considered in the London price index analyses are too small for the CC's results to be robust and meaningful for assessing the overall prices negotiated with PMIs. The number of treatments in the basket for each insurer used in the London price index analysis for 2011 conducted by the CC are set out below.

4.78 It is clear from the table above that the treatments considered in the CC's London price indices are unrepresentative of the entire portfolio of treatments that HCA, and indeed TLC, provide to PMIs. In particular, the number of treatments in the basket for Aviva, Pruhealth, Simplyhealth and WPA are too small for the CC to infer anything meaningful from the results. It is also questionable whether even the number of treatments considered for Bupa and AXA PPP are sufficient for the analysis to be robust. It is clear that [✂] treatments will not be representative of the full range of treatments that HCA or TLC provided to Bupa patients in 2011.

4.79 Given that the CC recognised the issues with comparing the "prices" of too small a number of treatments, it is unclear to HCA why the CC considered that creating a price index comprising so few treatments, in particular for Aviva, PruHeatlh, Simplyhealth and WPA, and attempting to draw inferences from the results of these analyses would be meaningful and could be relied upon to reach any provisional findings. HCA strongly contends that it cannot be justified.

4.80 This view is further supported by the fact that the basket of treatments account for only a very limited proportion of each PMI's expenditure with HCA and TLC, as shown in the figure below[215].

[212] HCA Response to the CC's Working Paper "Empirical analysis methodology of price outcomes in negotiations between hospital operators and insurers"
[213] Para. 6 of the CC's empirical analysis methodology paper.
[214] CC, PFs, Appendix 6.12, para. 4.
[215] HCA's advisers identified from the CC's STATA .do files that in calculating the number of treatments in each PMI's basket for the London price indices, the CC made errors resulting in an overestimation of the number of treatments in some of the baskets and therefore an overestimation in the percentages of expenditure that the baskets accounted for. This arose from the CC's failure to exclude episodes from HCA's non-central London facilities (namely the NHS Ventures Christie Clinic in Manchester and NHS Ventures UCLH in Romford, Essex). Whilst the CC correctly excluded these facilities from its actual computation of the price indices it failed to do so in its analysis of number of treatments in the basket and expenditures shares. HCA presents the correct figures its advisers generated.

Figure A4.4: Proportion of PMI expenditure accounted for by the basket, 2011

[✂]

4.81 HCA notes that the CC analysed the proportion of each PMI's expenditure using a range of metrics. By restricting the expenditures considered in the denominator of the calculation (by looking first at all expenditures, then expenditures where there is at least one CCSD code, then expenditures where there is only one recorded CCSD code), it appears that the basket accounts for a more sizeable share of expenditure than it actually does. However, for the purpose of understanding the prices charged to insurers, HCA submits that only the first proportion, considering overall expenditure, is meaningful. As highlighted previously, hospital operators negotiate prices with insurers over the entire range of treatments, across all CCSDs, inpatient, daypatient and outpatient activity. If the insured price analysis is to be used in any way to understand the relative bargaining position of HCA and the PMIs (which in any case HCA strongly rejects it can be) the basket needs to be representative of all expenditure.

4.82 On the basis of overall expenditure, the basket only accounts for a maximum of [✂] of expenditure with HCA and TLC in 2011 (for Bupa and AXA PPP). Even on the basis of the most restrictive measure analysing the PMI expenditure in the basket as a proportion of expenditure on treatments where there is only one CCSD invoiced for, the maximum proportion is only [✂]. The basket is clearly not representative of PMI's expenditure with HCA and TLC.

4.83 In addition to the absolute number of treatments included in the CC's baskets and the proportion of each PMI's expenditure they account for, it is important to understand the proportion of hospital activity the basket represents. This measure is also highly relevant in determining whether the basket is representative of the hospital operator's activity and hence whether the episodes included in the basket will be at all reflective of overall actual average episode charges. Whilst the majority of one hospital operator's treatments (by revenue) may be included in the CC's basket, another with a more diverse range of treatments may have a much smaller proportion represented by the basket.

4.84 Whilst the CC analysed the share of hospital operators' total insured revenue accounted for the basket in the context of the national price index it constructed, it failed to conduct a similar analysis for the London price index. The CC provided no justification for this and indeed did not allow HCA's advisers access to the required data for TLC, even within the confines of the confidential dataroom, to enable them to conduct the analysis themselves. However, HCA's advisers were able to analyse the proportion of HCA's insured revenues accounted for by treatments in the baskets, the results of which are shown in the figure below.

Figure A4.5: Proportion of HCA revenues accounted for by the baskets, 2011

[✂]

4.85 The analysis set out above provides clear evidence that the treatments considered in the London price index analyses are not representative of HCA's business. The maximum proportion of HCA's PMI revenue accounted for the basket is only [✂] (for Bupa and Bupa International combined). HCA's revenue generated from this basket, and certainly the baskets for other PMIs, accounts for a very small proportion of its total insured revenues and

consequently the results of the price indices cannot be informative of HCA's overall revenues.

4.86 Even if the CC were actually comparing prices (rather than episode charges as it does) it is clear that the results of the analyses could not be used to reach any findings, provisional or otherwise, about the overall prices that HCA is able to negotiate with insurers and hence the market power HCA has in these negotiations. Too few treatments are analysed, particularly for the smaller insurers. The treatments are not representative of PMI's overall expenditure with HCA and TLC and the revenues generated from the treatments by HCA are certainly not representative of their overall insured revenues with any of the PMIs.

The common basket of treatments offered by all of the large hospital operators to each insurer is unrepresentative and fails to capture HCA's treatment mix

4.87 In its national price index, the CC calculated a price index for a common basket of treatments offered by all of the large hospital operators to each insurer. HCA strongly considers that the baskets of treatments considered by the CC are not representative of the range of treatments it provides. In particular, in only analysing the treatments common across operators the CC necessarily narrowed the range of treatments considered. The baskets do not reflect the higher acuity more complex treatments that HCA provides compared to other national hospital operators. In general, other hospital operators provide a narrower range of treatments and less complex, lower acuity treatments than HCA.

4.88 The CC acknowledged that including all hospital operators in its national price index and thus having to identify a common basket of treatments across all these operators by insurer necessarily *"reduces the number of common treatments in the basket that could be compared"*.[216] HCA's concern is that, due to the nature of insurer negotiations (whereby charges are agreed over the full range of procedures), this reduction in scope resulted in the relevant index not accurately reflecting the overall charges agreed with PMIs across the full spectrum of treatments HCA provides.

4.89 As shown in the figure below, the baskets analysed are limited in size relative to the overall number of treatments provided to each PMI (some approximately [✂] possible CCSDs in 2011 in HCA's case). Furthermore, it is clear that the baskets account for a relatively small proportion of each insurer's overall revenues with the national hospital operators, capturing at most [✂] of a PMI's total expenditure with the national hospital operators.

Figure A4.6: Proportion of expenditure accounted for by each PMI's basket – all operators, 2011

[✂]

4.90 In addition to the absolute number of treatments included in the CC's baskets and the proportion of each PMI's expenditure they account for, it is important to understand the proportion of hospital activity the basket represents. The figure below shows the share of each hospital operator's total insured revenue accounted for by the national price index basket in 2011.

[216] See para. 10 of Appendix 6.12 to the CC's Provisional Findings.

Figure A4.7: Share of hospital operators' total insured revenue accounted for by the basket, by PMI – all operators, 2011[217]

PMI	BMI	HCA	Nuffield	Ramsay	Spire
Aviva	20%	6%	25%	26%	19%
AXA PPP healthcare	31%	15%	40%	42%	30%
Bupa/Bupa International	27%	15%	41%	39%	29%
PruHealth	48%	25%	28%	25%	53%
Simplyhealth	104%	11%	25%	26%	17%
WPA	13%	6%	15%	13%	13%

4.91 The figures on revenue share of the treatments included in the national price index basket confirm that HCA's concerns regarding the representativeness of the basket are indeed well founded. HCA notes that the maximum share of its insured revenue with a PMI is 25% and the basket account only for 15% of the HCA's revenues with BUPA and AXA PPP, the two largest PMIs, and merely 6% of HCA's revenues with Aviva, the third largest insurer. It is clear that the baskets analysed by the CC are less representative of HCA's business than that of any of the other hospital operators.

4.92 By using a basket of treatments common across HCA and other hospital operators, the CC is necessarily focussing on only a narrow subset of the treatments provided by HCA. It is capturing the less complex CCSDs that all hospital operators are able to treat patients for, for example in smaller facilities and facilities without advanced treatment technologies or critical care capabilities. Whilst HCA does treat patients across a broad spectrum of CCSDs, as explained in sub-sections (1) and (2) above, given HCA's quality, investment and innovation it is able to treat more complex cases and provide procedures in higher acuity, complex CCSDs that other hospital operators are not able to.

4.93 HCA strongly submits that the lack of representativeness of the CC's basket of treatments used in the national price index means that the CC cannot infer anything from the results of its analysis about relative bargaining power, even setting aside all the other issues with the CC's analysis that HCA has set out throughout this Appendix.

The CC used incomplete data for PMIs, with insufficient data over the time period for some PMIs, other PMIs were completely omitted and some PMIs incorrectly grouped together

4.94 An additional data issue indentified by HCA, and also noted by the CC, is the lack of sufficient and robust data for a number of the smaller PMIs over the time period considered by the CC. Indeed, in some of its analyses (for example the insured price index for HCA and TLC presented in table 9), the CC has only analysed insured prices for Bupa and AXA PPP as, *"for these PMIs historical data appear to be more complete than for other PMIs"*.[218] HCA

[217] HCA notes that for this analysis, the CC used the total insured revenue (across all treatments) from the hospital operators' response to the Market Questionnaire in its analysis. Whilst in some cases this revenue figure may be more complete than at captured within the cleaned Healthcode data used by the CC, there are some apparent data issues as the basket clearly cannot account for 104% of BMI's total insured revenues from Simplyhealth.
[218] CC, PFs, Appendix 6(12), para. 21.

considers that the CC is unable to present any robust analysis for the remaining PMIs over the five year time frame considered by the CC

4.95 Furthermore, HCA considers that the CC's analysis is flawed as the Healthcode data is incomplete given that it does not include all PMIs. HCA's advisers note that as part of the data cleaning process the CC dropped the data for all PMIs other than the "main insurers" (Aviva, AXA PPP, BUPA and BUPA International, Pruhealth, Simplyhealth and WPA)[219]. As a result, the CC deleted 90,854 observations from its analysis. As HCA's advisers were not given access to the CC's data before this data cleaning step had been taken, they were unable to ascertain the extent to which data was available for the other PMIs.

4.96 Specifically, HCA notes that the CC did not include Cigna in its analysis. It considers this particularly problematic as it further renders the analysis unrepresentative of HCA's business. In 2011, Cigna accounted for approximately [✂] of HCA's total inpatient and daycase revenues, [✂]. Whilst nationally Cigna may be a relatively small PMI player, its presence in London is stronger. According to market intelligence, Cigna accounts for approximately [✂] of all large corporate business, with many of these corporates having headquarters in London. By failing to account for this PMI the CC applied a national picture of PMI coverage inappropriately to London.

4.97 HCA is also concerned with the CC's incorrect merging of the Healthcode data for Bupa and Bupa International patients. [✂][220]. [✂]. HCA discusses the implications of this in relation to the CC's results in sub-section (4) below.

4.98 Furthermore, HCA has concerns in relation to the completeness of data for those PMIs which are included in the analyses due to changes in ownership during the period considered in the CC's insured pricing analysis. HCA's advisers note that the CC appeared to have accounted for PruHealth's acquisition of Standard Life Healthcare in 2010 by combining the Healthcode data for them[221]. However, it should be noted that the two separate charge masters for PruHealth and Standard Life with HCA were not merged, at PruHealth's request[222], until after 2011. The CC did not appear to follow a similar step to consolidate insurers' data to reflect Simplyhealth's creation from a series of mergers the latest of which, with Medisure, took place in December 2007. HCA, therefore, is concerned that the invoicing data for 2007 is incomplete and does not capture all insured patients for what became Simplyhealth.

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[219] The CC STATA .do file, create_data_pindex states:

```
 * keep main insurers only
. keep if       ins_name=="aviva" | ///
>                   ins_name=="axa ppp healthcare" | ///
>                   ins_name=="bupa/bupa international" | ///
>                   ins_name=="pruhealth/slh" | ///
>                   ins_name=="simplyhealth" | ///
>                   ins_name=="wpa"
(90854 observations deleted)
```

[220] [✂].

[221] The CC STATA .do file, create_data_pindex states:

```
. replace ins_name = "pruhealth/slh" if ins_name=="pruhealth"|ins_name=="standard life healthcare"
(183938 real changes made)
```

[222] This was because it was taking PruHealth longer to merge the newly acquired Standard Life business than originally expected.

4.99 In summary, HCA submits that the incompleteness of the CC's data for PMIs and the additional issues identified above associated with the merging of PMI datasets means that the results of the analyses are flawed and it is inappropriate for the CC to rely on the results to make any inferences about overall "prices" charged in the market.

(4) THE RESULTS OF THE CC'S ANALYSES DO NOT SUPPORT ITS PROVISIONAL FINDINGS

4.100 HCA submits that the results of each of the CC's analyses, as reviewed and tested by HCA's advisers in the CC's dataroom, do not support the provisional findings that the CC reached and there is no evidence to sustain the CC's position on bargaining power of HCA over PMIs. In addition to the issues already set out in this Appendix which mean that the CC cannot support a finding of market power in negotiations with PMIs, (namely that: the CC did not properly measure prices; it failed to take account of quality and cost differences; and the CC's analysis lacked robustness due to key methodological issues), HCA strongly contends that there is no evidence in the results of the CC's analysis to support the CC's finding that, *"higher insured prices at the national level arise because of the lack of sufficient competitive constraints faced by hospital operators at the local level".*[223]

4.101 In this section, HCA sets out its views in relation to the results the CC obtained in a number of its analyses. HCA presents evidence to demonstrate that the CC's interpretation of its results to infer HCA's market power and bargaining strength is incorrect and unsubstantiated. HCA submits that:

- The London price index does not show that HCA's "prices" are "significantly higher" than TLC's as the CC claimed;
- The results of the average revenue per admission do not suggest that differentials in the measure across hospital operators arise as a result of bargaining power; and
- The national price index does not demonstrate HCA has bargaining power as the CC suggested.

4.102 Each of these points is addressed in turn in this section of the Appendix.

The London price index does not show that HCA's "prices" are "significantly higher" than TLCs as the CC claimed

4.103 In an attempt to control for the cost and treatment differences of HCA compared to other non-London operators, the CC constructed a separate price index comprising a common basket of treatments offered by HCA and TLC (the "London price index"). The CC argued that TLC is HCA's closest competitor in terms of a range of treatments and cases provided. For these reasons, according to the CC, *"the price index comparison between HCA and TLC should better control for cost differences arising from higher costs and/or from differences in the mix of treatments and cases provided in central London"*.[224]

4.104 However, as HCA set out in section (2), it strongly considers that the CC failed to take account of cost differences arising between itself and other hospital operators. This also applies to the London price index where the CC failed to account for cost differences between HCA and TLC, including those arising from TLC's charitable status advantage (as

[223] CC, PFs, para. 6.242.
[224] See para. 21 of appendix 6.12 to the CC's Provisional Findings.

explained in sub-section (2)) and as a result of quality differentials, as shown below. This means that the CC was not comparing like for like. HCA incurs significant additional costs per admission due to the quality service and wider range of treatments that it provides. For example:

- The nurse to patient ratio at HCA is higher than at TLC which also results in increased costs. HCA has a nursing ratio (for standard nurses) of approximately 0.33 compared to 0.25 at TLC[225]. Assuming this holds for all nurses, and based on total admissions figures for HCA and TLC, HCA has estimated the average additional cost per patient visit. Assuming the cost per nurse at HCA and TLC are the same (approximately [✂] per annum), the higher nurse to patient ratio HCA employs results in an estimated additional cost of approximately [✂] for each patient treated[226].

- Furthermore, as HCA has additional ITU beds compared to TLC, including on a per admission basis, it estimates that it incurs higher ITU nursing costs than TLC. According to the CC[227] TLC had 11 CCL3 beds in 2011 compared to HCA's 57. HCA estimates that the additional nursing cost of HCA's CCL3 beds is approximately [✂] (based on a cost per ITU nurse per annum of [✂] (for adult ITU) and [✂] (for paediatric ITU)[228].

- HCA employs [✂] resident medical officers (RMOs) at an average annual cost per RMO of [✂][229]. These RMOs are present at an HCA facility at all times. Based on 2011 admissions, this equated to an estimated average cost to HCA per admission of approximately [✂], a higher cost than that incurred by TLC. Based on HCA's understanding, TLC (and other hospital operators) does not employ onsite RMOs, choosing instead to have RMOs on call from agencies, a cheaper alternative. HCA's model, albeit at a greater cost, helps to increase quality and maintain continuity to the benefit of patients.

- HCA operates its own, wholly-owned clinical research unit for cancer patients (at SCRI), a service that can be integrated into the treatment pathway, whereas TLC does not. The operating expenditure for SCRI was over [✂] in 2011.

- HCA provides a number of relatively expensive services within a number of specialties which TLC does not provide, including in paediatrics and neurorehabilitation. Also, whilst TLC does provide some cardiology services, it does not offer cardiac surgery. HCA incurs significant incremental costs associated with the provision of each of these services (e.g. paediatric ITU beds, advanced technologies and specialist staff).

4.105 Notwithstanding this and the fact that the CC did not analyse actual prices (rather it analysed episode charges which capture a significant amount of variation depending, for example on patient characteristics and treatment requirements), HCA submits that the CC's provisional finding that, *"our [the CC's] analysis of insured prices shows that HCA's prices on the basis of the price index are significantly higher than those of its closest competitor in central London, TLC, and, as our [the CC's] analysis of competitive constraints in central London*

[225] TLC's website: http://www.thelondonclinic.co.uk/about-us/our-people
[226] [✂].
[227] CC, PFs, Appendix 6.10, Table 10
[228] [✂].
[229] [✂].

shows, these prices are associated with a high concentration and a low substitutability of HCA hospitals at the local level"[230] cannot be supported.

4.106 HCA sets out below the results of the CC's London price index for Bupa (including Bupa International) and AXA only over the period 2007 – 2011. The results for all insurers in 2011 are not reported given that, as HCA sets outs in sub-section (3), the treatments in the baskets for all the other insurers (Aviva, Pruhealth/SLH, Simplyhealth and WPA) are too small in number to produce any robust and meaningful results. Furthermore, as HCA's share of revenue analysis in Figure A4.5 shows, the baskets analysed are unrepresentative of HCA's overall business with all insurers.

Figure A4.8: Insured price index for Bupa & Bupa International and AXA PPP – HCA and TLC, 2007−2011

	PMI	HCA	TLC	% difference between HCA and TLC price index	PMIs' volume share (admissions in the basket) %	CCSDs in basket
2011	AXA PPP	[✂]	[X]	[X]	[✂]	[✂]
	Bupa and Bupa International	[✂]	[X]	[X]	[✂]	[✂]
	Weighted average price index	[✂]	[X]	[X]	[✂]	[✂]
2010	AXA PPP	[✂]	[X]	[X]	[✂]	[✂]
	Bupa and Bupa International	[✂]	[X]	[X]	[✂]	[✂]
	Weighted average price index	[✂]	[X]	[X]	[✂]	[✂]
2009	AXA PPP	[✂]	[X]	[X]	[✂]	[✂]
	Bupa and Bupa International	[✂]	[X]	[X]	[✂]	[✂]
	Weighted average price index	[✂]	[X]	[X]	[✂]	[✂]
2008	AXA PPP	[✂]	[X]	[X]	[✂]	[✂]
	Bupa and Bupa International	[✂]	[X]	[X]	[✂]	[✂]
	Weighted average price index	[✂]	[X]	[X]	[✂]	[✂]
2007	AXA PPP	[✂]	[X]	[X]	[✂]	[✂]
	Bupa and Bupa International	[✂]	[X]	[X]	[✂]	[✂]
	Weighted average price index	[✂]	[X]	[X]	[✂]	[✂]

Source: HCA analysis

4.107 HCA submits that looking at the overall differences in the CC's weighted average price indices is in itself meaningless and it masks the true underlying results. For example, having analysed the actual episode charges, HCA's advisers found that for [✂]% of the CCSDs included in the combined Bupa and AXA baskets for the London price index in 2011, both HCA's minimum and maximum episode charges are below TLC's, whereas the converse is true for TLC for only [✂]% of CCSDs. Furthermore, there are significant differences year on year between PMIs.

[230] CC, PFs, para. 6.247(d).

4.108 Importantly, however, and contrary to its own best practice,[231] the CC also omitted to report results from any test of statistical significance. Given that the CC appeared to believe that the comparison of the price indices it constructed for a basket of treatments provided by a hospital operator to a PMI could allow it judge whether one hospital operator was more expensive (and so had more bargaining power over PMIs) than another and to quantify a "price" differential, HCA considers that the CC's failure to conduct any test of statistical significance of the estimates found in the insured price analysis is a severe deficiency. Indeed, HCA notes that this approach is inconsistent with the analytical approach taken for the PCA, where the CC recognised the importance of developing and testing hypotheses and testing the statistical significance of estimates.

4.109 A standard test of statistical significance of the difference between the hypothetical expenditure (i.e. the numerator of the insured price index) constructed by the CC for TLC and HCA in 2011 cannot reject at 5% significance level the null hypothesis that TLC's episode charges are, on average, the same as HCA's in the case of Bupa.[232] Furthermore, the CC's findings are further undermined when considering the statistical significance of differences in average episode charges for the treatments (CCSDs) in the common basket across TLC and HCA. HCA's advisers found that:[233]

- HCA's episode charges are not statistically significantly different from TLC's for *[redacted]* of CCSDs in the case of Bupa's patients, for 2011.
- Also, in the case of Bupa's patients, one sided tests show that TLC's episode charges are actually statistically significantly higher than HCA's for *[redacted]* of CCSDs, for 2011, whilst HCA's prices are statistically significantly higher than TLC's prices for BUPA in the same year for only *[redacted]* of CCSDs.
- HCA's episode charges are not statistically significantly different from TLC's for *[redacted]* of CCSDs in the case of AXA PPP patients, for 2011.
- In the case of AXA PPP's patients, TLC's episode charges are actually statistically significantly higher than HCA's for *[redacted]* of CCSDs, for 2011.

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[231] The CC's own Best Practice on the submission of technical economic analysis states: *"When presenting the results of statistical and econometric modelling in written submissions, parties should always include the appropriate diagnostic test results (t-statistics, R^2, etc). Unless the CC is able to understand both the statistical and economic significance of the reported results it will not be able properly to evaluate the importance of modelling output and the results will be less influential. Accordingly, the economic significance of results should also be explained, especially when this is not clear from the econometric output." (emphasis added)* (CC, "Suggested best practice for submissions of technical economic analysis from parties to the Competition Commission", para. 17. Available on www.competition-commission.org.uk). The insured price analysis is a statistical analysis, in that it compares summary statistics from different distributions of observed episode charges.

[232] A description of how the test is constructed can be found in Annex A.

[233] HCA's advisers conducted (and reports the results of) the statistical test at a 5% level of significance. These findings also hold if performing the statistical test at a 10% significance level. In the case of Bupa in 2011, HCA's average episode charges are not statistically significantly different from TLC's for *[redacted]* of CCSDs and TLC's average episode charges are statistically significantly higher than HCA's for *[redacted]* of CCSDs, for the year 2011. In the case of AXA PPP in 2011, HCA's average episode charges are not statistically significantly different from TLC's for *[redacted]* of CCSDs and TLC's average episode charges are statistically significantly higher than HCA's for *[redacted]* of CCSDs, for the year 2011.

4.110 Notwithstanding the fact that HCA considers the basket sizes for the smaller PMIs too small for the CC to attempt to draw any conclusions from the results of the price indices, HCA's advisers found that:

- HCA's episode charges are not statistically significantly different from TLC's for *[redacted]* of CCSDs in the case of Aviva, SimplyHealth and WPA patients, for the year 2011. However the sample sizes are extremely limited.[234]
- HCA's episode charges are not statistically significantly different from TLC's for *[redacted]* of CCSDs in the case of PruHealth patients, for the year 2011. The sample size is extremely limited in this case also.[235]

4.111 In sum, having performed standard tests of statistical significance of the estimates from the CC's own insured price analysis, it is clear to HCA's advisers that the CC does not have evidence to support its provisional finding that, "*HCA's prices on the basis of the price index are significantly higher than those of its closest competitor in central London, TLC".*[236] The substantial variation in the episode charges for the same CCSDs implies that HCA's charges cannot be considered statistically different from TLC's in a number of cases and indeed in some cases HCA's charges are actually lower. These results are at odds with the CC's view that, as a result of its market power, HCA has stronger bargaining power than TLC in negotiations with PMIs. As HCA has explained, the large variation in episode charges can be explained by the complexity of cases, patient co-morbidities, quality and other factors that are likely to drive the cost of the treatment. The analysis of insured prices carried out by the CC simply fails to take these factors into account.

4.112 Even without the results of these statistical significance tests, HCA's advisers consider that the variability in the price indices across insurers over time highlights that the results cannot be used, as the CC did, to reach any findings about HCA's market power in negotiations with PMIs. For example, according to the CC's analysis, between 2009 and 2010 the percentage difference between the HCA and TLC price indices for Bupa [✂] by approximately [✂] percentage points and between 2010 and 2011 the percentage difference between the HCA and TLC price indices for AXA PPP [✂] by approximately [✂] percentage points. All these differences, in HCA's view, are clearly explained by differences in the specific services delivered in different episodes as well as in the quality and costs associated with different episodes year after year and across PMIs. Conversely, to interpret these differences in terms of bargaining power would require the CC to explain what drivers of bargaining power are varying across PMIs and year on year. Clearly no such variation can be accounted for by changes in market structure, which the CC incorrectly considers an important driver. For these reasons these results are fundamentally at odds with the CC's provisional findings.

4.113 Furthermore, when analysing changes in the weighted average insured "price" of the common basket of treatments for AXA both in nominal and real terms for HCA and TLC over the period 2007 – 2011, as shown in the figure below, HCA's advisers find that the nominal weighted average price only increases by a compound annual growth rate (CAGR) of [✂] in

[234] The London price index baskets contained [✂] common treatments across HCA and TLC for Aviva and [✂] treatments for SimplyHealth and WPA.
[235] The London price index baskets contained [✂] common treatments across HCA and TLC for PruHealth
[236] CC, PFs, para. 6.247(d).

nominal terms over the period 2007 – 2011 and in fact fell by a CAGR of [✂] in real terms[237] over the five year period. HCA submits that this is not consistent with it having market power and using bargaining power in negotiations with PMIs to extract higher prices. If it did have such bargaining power, HCA would be able to ensure that any price increases at least matched the inflation it faced.

Figure A4.9: Weighted average insured price of common basket of treatments for AXA – HCA and TLC, 2007-2011

[redacted]

4.114 Another way in which the robustness of the CC's results can be tested is to construct an index comparing HCA to another central London competitor. If it is the case, as the CC asserts, that HCA has market power in central London and uses this to negotiate higher insured prices with PMIs, it could be expected that the price indices comparing HCA to another central London hospital operator (indeed one which the CC does not even consider to be HCA's closest competitor) would show that HCA's price index across all insurers is consistently higher. As the results set out in the figure below demonstrate, this is not the case when comparing HCA's and [✂]'s insured price indices.

Figure A4.10: Insured price index for Bupa & Bupa International and AXA PPP – HCA and [✂], 2007−2011

[✂]

Source: HCA analysis

4.115 HCA's advisers note that similar deficiencies apply to this analysis as to the comparison with TLC in terms of the failure to assess prices and the methodological flaws arising from data issues and the failure to account for key factors influencing costs and episode charges. However, if the CC believes that those issues are not so substantive as to undermine its HCA/TLC price index comparison it must also accept this evidence showing that [✂] was able to extract better "prices" than HCA from Bupa in both 2010 and 2011 and indeed there is virtually no difference in the weighted average price index (considering Bupa and AXA together) in 2011.

4.116 This analysis again demonstrates that the price index cannot be used as a measure of market power. It is unclear how the CC could reconcile the results obtained both in its own analysis and that of HCA's advisers with a finding of, "*higher prices for insured patients for treatments by those hospital operators (HCA, BMI and Spire) that have market power in negotiations with PMIs.*"[238]

4.117 HCA's contention that the CC cannot support the finding above through its insured price analysis, and specifically in relation to the London price index analysis, is lent further weight by the fact that the CC's results do not hold when considering different assumptions.

[237] The deflator used to calculate the real terms figures presented is the ONS CPI-Health (as per the CC's analysis). HCA notes that other deflators could be used, for example the CPI- all items, CPI-Hospital services, CPI-nurses wages and CPI–weighted wages. Each of these alternative deflators would produce results showing a greater reduction in the weighted average price in real terms.
[238] PFs, para. 72, emphasis added.

4.118 Considering inpatient episodes only, a sensitivity test the CC conducted on the national price index[239] but failed to perform for the London price index, HCA's advisers find that the difference between the HCA and TLC price indices narrows for both AXA and Bupa in 2010 and 2011. Indeed, as the results presented in the figure below show, the price index analysis for HCA is over *[redacted]* than TLC's for Bupa in 2010 and only around *[redacted]* in 2011.

Figure A4.11: Insured price index for Bupa & Bupa International and AXA PPP – HCA and TLC, 2007−2011 (Inpatients only)

	PMI	HCA	TLC	% difference between HCA and TLC price index	PMIs' volume share (admissions in the basket) %	CCSDs in basket
2011	AXA PPP	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Bupa and Bupa International	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Weighted average price index	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2010	AXA PPP	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Bupa and Bupa International	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Weighted average price index	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2009	AXA PPP	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Bupa and Bupa International	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Weighted average price index	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2008	AXA PPP	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Bupa and Bupa International	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Weighted average price index	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2007	AXA PPP	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Bupa and Bupa International	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Weighted average price index	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Source: HCA analysis

4.119 Correctly accounting for Bupa patients (i.e. separating Bupa and Bupa International) also has an impact on the results obtained and results in the HCA price index for Bupa being *[redacted]* than TLC's in 2010 and less than *[redacted]* than TLC's in 2011[240].

4.120 Furthermore, the collective impact of correctly accounting for Bupa patient episodes and only considering inpatient episodes results in the percentage difference between the HCA and TLC price indices becoming negative in 2010 and *[redacted]*[241].

[239] The CC explains this sensitivity test in para. 14 of CC, PFs, Appendix 6.12 and presents the results in Annex D of that same Appendix.
[240] These are included as Annex B to this response.
[241] *Ibid.*

4.121 HCA submits that the variation in the results obtained is due to those factors not considered in the CC's analysis (such as quality and complexity), that determine different episode charges. Importantly, a view that this index can be informative of the relative bargaining power of operators needs to be able to explain this variability. In particular the CC needs to explain the different values of the index for operators that have different positions in terms of what the CC considers an important driver of bargaining power: the ownership of hospitals.

4.122 However, if the CC does consider the results of its own insured price analysis can be used to understand price differentials between hospital operators and allow it to draw conclusions about relative bargaining power (which, as HCA strongly contends through this Appendix, it cannot), HCA submits that the CC must place due weight on the results of HCA's "prices" (as measured purely by the weighted average price index) being lower than TLC's for Bupa (correctly excluding Bupa International) for inpatients. This, along with the results for the [✂], indicates that HCA's "prices" (by the CC's measure) are not always higher than the prices charged by its London competitors. Importantly these different values of the index, clearly show that the ownership of hospitals cannot possibly be seen to explain any alleged differences in bargaining power. Market structure simply does not vary in a way that is consistent with it being a driver of differences in the index. Therefore, even if the CC considers its London price index to be informative about bargaining power, it must concede that the bargaining power it observes is not affected by the ownership of hospitals.

4.123 In summary, in relation to the London price index, HCA submits that the CC's analysis cannot be relied upon to form a view of HCA's bargaining power with PMIs. As explained in this Appendix, HCA submits that the CC has not properly measured prices and therefore has not conducted an actual price analysis. Instead, it analysed episode charges which themselves are subject to considerable variation based, for example, on treatment complexity and individual patient characteristics. These variations are not uniform across CCSDs or hospitals.

4.124 Even if the CC had conducted an actual price analysis, HCA submits that the results could not be relied upon due to serious data flaws and methodological flaws in the analysis, for example failing to control for quality and other hospital characteristics affecting cost and using baskets of treatments that are too small and/or not representative of HCA's overall business. These factors render the results of the London price index analyses meaningless in themselves.

4.125 However, notwithstanding this, HCA strongly considers that the results that the CC has obtained do not support the provisional findings it reached. In particular:

- The failure to account for cost differences between HCA and TLC, including those arising from TLC's charitable status and as a result of quality differentials, means that the CC was not comparing like for like.

- The treatments in the baskets for Aviva, Pruhealth/SLH, Simplyhealth and WPA are too small in number and the revenues HCAs derives from this are completely unrepresentative of HCA's overall business with these insurers. Indeed, this also applies for the baskets analysed for Bupa and AXA PPP.

- The CC failed to conduct statistical significance tests on its results and if it had it would have realised that there is insufficient evidence that HCA's "prices" are "significantly higher". HCA's episode charges are not statistically significantly different from TLC's for *[redacted]* of CCSDs in the case of Bupa patients, for 2011 and not statistically

significantly different from TLC's for *[redacted]* of CCSDs in the case of AXA PPP patients, for 2011.

- Even without the results of statistical significance tests there is evidence that the CC's analysis cannot be used to make inferences about market power or draw a conclusion that, *"weak competitive constraints in many local markets including central London... are likely to lead [...] to higher prices for insured patients for treatment by those hospital operators (HCA, BMI and Spire) that have market power in negotiations with PMIs"*.[242]

- HCA's price indices for individual PMIs vary considerably over time which is not consistent with any evidence of how the drivers of bargaining power have changed over the same period. Specifically it is inconsistent with hospital ownership or concentration being a driver of bargaining power

- A comparison with [✂] shows another example where HCA's "prices" (by the CC's measure) are not higher than those charged by its London competitors.

- Similar results are also obtained by analysing inpatient only activity and by correctly accounting for Bupa patient episodes (i.e. excluding Bupa International).

The results of the average revenue per admission do not suggest that differentials in the measure across hospital operators arise as a result of bargaining power

4.126 The CC's analysis of insured revenue per admission attempted to calculate the average price per insured patient admission charged to each PMI in each year from 2007 to 2011. As a result of conducting this analysis, the CC found that, *"HCA charges significantly higher prices to PMIs individually and on average".*[243] HCA strongly considers that this finding cannot be supported, given the deficiencies in the CC's analysis that HCA has already identified throughout this Appendix.

4.127 The CC's results for 2011 are set out in the figure below.

Figure A4.12: Weighted average revenue per admission, all operators, 2011

[✂]

Source: CC analysis

4.128 HCA finds it unsurprising that the CC found that the percentage difference in the weighted average revenue per admission measure between HCA and BMI (the hospital operator with the next highest result) was *[redacted]* in 2011. There are a number of reasons for a differential of this scale, however the two main reasons are HCA's higher costs compared to other national hospital operators, arising from, for example, the central London location of the majority of HCA's facilities and its high quality healthcare provision and its focus on the provision of complex, high acuity healthcare. As explained earlier in the Appendix, the CC failed to control for both of these factors in general throughout its insured price analysis and particularly in its average revenue per admission analysis.

4.129 HCA explained in detail in sub-section (2) of this Appendix that it faces higher costs than other national hospital operators due to the central London location of a number of its

[242] CC, PFs, Summary, para. 72.
[243] CC, PFs, Summary, para. 72.

facilities. This not only affects property costs but also a range of other input costs such as the wages of staff. Furthermore, as a high quality operator with a focus on delivering the best possible patient care and outcomes, HCA incurs higher costs compared to other hospital operators. The CC acknowledged that HCA's costs are likely to be higher than other hospital operators, noting that, *"the cost profile of a hospital operator such as HCA, which has almost all its hospitals located in central London, is likely to be different from the cost profile of hospital operators that do not have a significant central London presence".*[244] HCA strongly submits that this is the case and this explains at least part of the differential in the average revenue per admission measure between it and other hospital operators against which it was compared.

4.130 Furthermore, the CC also itself acknowledged that the average revenue per admission measure, *"does not control for the different mix of treatments and cases within each treatment (e.g. more complex versus less complex cases, inpatient versus daycases) that hospital operators may have"*[245] and that costs differences may arise, *"because of the different mix of treatments and cases provided in central London compared with the rest of the UK (e.g. high acuity and complex treatments)".*[246] HCA agrees with these statements and strongly considers that the CC's results clearly reflect these differentials in the type of private healthcare it provides. As explained in sub-section (2) of this Appendix (and throughout all submissions HCA has made to the CC), HCA focuses on the provision of complex, high acuity healthcare at a higher level of quality than other hospital operators, which by nature is more expensive to provide and so earns higher revenues per admission. Indeed, the different mix of treatments it provides to patients is also clear from the limited number of treatments and proportion of HCA's revenues that are accounted for in the common basket of treatments used by the CC in its national price index analyses.

4.131 Given the two main factors outlined above, HCA considers that a comparison of its average revenues per admission against those of other hospital operators is entirely meaningless. It strongly disagrees with the CC's opinion that this measure is *"informative*".[247]

4.132 HCA is highly concerned that the CC considered it to be informative given the deficiencies with the analyses it acknowledged itself (as quoted above). Furthermore, HCA would be highly concerned if the CC were to rely on these results to support its position in relation to HCA's supposed bargaining power in negotiations with PMIs and the supposed weak competitive constraints on it at the local level leading to higher insured prices. HCA contends that the CC has no evidence to support this view and certainly no evidence from the results of the average revenue per admission analysis.

4.133 Indeed, the results of the CC's analysis of the average revenue per admission over the period 2007 – 2011 show that in real terms[248] HCA's average revenue per admission fell for both Simplyhealth and WPA (by [✂] and [✂] respectively). Furthermore, the real terms increase in HCA's average revenue per admission from AXA PPP and Bupa grew by only [✂] and [✂] over the period. Given that HCA has increasingly moved toward providing more

[244] CC, Provisional Findings, Appendix 6.12, para. 20.
[245] CC, Provisional Findings, Appendix 6.12, para. 5.
[246] CC, Provisional Findings, Appendix 6.12, para. 20.
[247] CC, Provisional Findings, Appendix 6.12, para. 6.
[248] Again, HCA uses the CC's approach to calculating real term figures using the ONS CPI – Health.

complex high acuity treatments[249] it would be expected that HCA's average revenue per admission would increase to reflect the increased costs of providing more complex healthcare. The fact that the measure has in fact fallen in real terms for some insurers and increased only marginally for the two largest insurers is not consistent with HCA having bargaining power over the PMIs. If that were the case, it would be expected that HCA should use its relative strength to ensure that its revenues per admission from insurers increased at a rate to at least cover its cost increases. The analysis of the average revenue per admission measure over time does not suggest that was the case.

The national price index does not demonstrate HCA has bargaining power as the CC suggested

4.134 The CC conducted a further analysis comparing HCA to the other national hospital operators: its national price index for a common basket of treatments across all hospital operators. The results of this analysis, combined with the analysis of the drivers of price outcomes (in which HCA was not included), should, according to the CC, provide insight into the degree of any market power held by hospital operators in negotiations with PMIs.[250]

4.135 As explained throughout this Appendix, HCA submits that is not the case because of the various problems and flaws with the CC's analysis. Therefore the results cannot be used to make any conclusions in relation to HCA's relative bargaining position in negotiations with insurers. Specifically, the analysis cannot support the overly simplistic provisional finding that*, "In comparison with the other four largest hospital operators (i.e. BMI, Spire, Nuffield and Ramsay) HCA charges significantly higher prices to PMIs (on average and for individual PMIs) based on both price measures (the national price index and average revenue per admission) and over time"*.[251]

Figure A4.13: Weighted average price index for common basket of treatments, all operators, large insurers only, 2007−2011

[✂]

Source: CC analysis

4.136 It can be seen from the results obtained by the CC, as set above, that it is indeed the case that in each year analysed there is a sizeable percentage difference between HCA's weighted average price index and that of the operator with the next highest weighted average price index (BMI). This difference ranges from approximately *[redacted]* in 2011 to approximately *[redacted]* in 2007. The results also indicate that there is some variation in the differences between HCA's and BMI's insured price indices across insurers as well as across time. Similar to the London price index, the CC has in no way explained this variation and the drivers of bargaining power that have changed over this period to explain such changes in the indices over time. HCA submits that there is no evidence that it has bargaining power over PMIs and that this has changed over time. It is unclear whether the CC is able to explain these differences in terms of changes in the underlying drivers of bargaining power. It is HCA's view that it simply cannot.

[249] For example, HCA has introduced new and innovative treatments and technologies which allow it to treat previously untreatable patients and more complex cases. It has also invested significantly in its critical care facilities in order to be able to treat more complex, high acuity cases.
[250] CC, PFs, para. 212.
[251] CC, PFs, para. 6.247(a).

4.137 Given that the CC's analysis considered episode charges rather than prices and did not control for the complexity of cases even within CCSDs, which clearly impact on episode charges, the CC was not in a position to be able to assert that, *"HCA charges significantly higher prices to PMIs".*[252] HCA contends that the national price index does not allow a *"like for like comparison"* as the CC claimed[253] and it is not informative.

4.138 Furthermore, even if the CC considers that the national price index can be used to draw conclusions about prices, given that, as explained in sub-section (3) of this Appendix, the baskets of treatments used in the analysis account for such a limited proportion of HCA's overall insured revenues from each PMI (an average of [✂]) the results cannot be used to draw conclusions about the prices negotiated with insurers over the entire range of HCA's treatments – a fact the CC itself identified[254]. The CC only looked at the weighted average revenues earned by HCA from a range of PMIs for patient episodes over a small subset of treatments that HCA provided in each year of the analysis to these insurers. The general conclusions identified by the CC cannot be applied to HCA and it submits that the results are not reliable and cannot be used to make any assertions about market power.

4.139 Notwithstanding these issues, even if the CC were to consider that the assessment of revenues earned from PMI patient episodes over the limited common basket of treatments is sufficient to make general conclusions about prices (rather than simply episode charges) overall, HCA strongly considers that the results the CC has obtained of a *[redacted]* gap between HCA's and BMI's average weighted price indices in 2011 (and indeed gaps observed in earlier years) are consistent with quality, treatment and other cost differentials (such as those arising from the central London location of the majority of its facilities) between HCA and other hospital operators.

4.140 Healthcare is characterised by considerable product differentiation – both horizontal differentiation in terms of the range of treatments and services provided and vertical differentiation in terms of the quality of the provision. Where there is differentiation on the basis of quality, for example, it would be expected that prices reflect this. As explained above, higher quality provision is typically associated with a higher cost of provision. HCA's higher quality, as evidenced by its outcome and quality metrics, compared to other hospital operators explains, at least in part, some of the observed difference between HCA's weighted average price index and that of the operator with the next highest index score.

4.141 As noted earlier in this Appendix, differences in the range and complexity of treatments provided and indeed the complexity of cases (even within CCSDs) will impact on costs and revenues earned from the PMIs. Whilst the CC asserted that a common basket of treatments price index controls for the *"mixed effect of different treatments provided by hospital operators",*[255] HCA strongly considers that this not the case. The mix of treatments provided by HCA and the higher complexity of cases within common CCSDs, which result in HCA incurring higher costs, is an important driver of the higher episode charges observed. Indeed, the CC stated that*, "our [the CC's] view is that cost differences, in particular due to*

[252] CC, PFs, para. 6.247(a).
[253] CC, Provisional Findings, Appendix 6.12, para. 6.
[254] In para. 4 of Appendix 6.12 of the PFs, the CC stated that, *"comparing the price of too small a number of treatments may lead to distorted results as the hospital operator may have higher or lower prices elsewhere"*. HCA considers that this statement applies not only in terms of the absolute number of treatments considered but also the proportion of the overall insured revenues the basket accounts for.
[255] CC, Provisional Findings, para. 6.208.

variations in the mix of treatments... are likely to have a significant impact on prices for HCA relative to the other four largest operators".[256]

4.142 Clearly, the differential in the national price index between HCA and the next highest operator will also be explained to a large extent by the higher costs HCA incurs due to the predominantly central London location of its facilities. These higher costs manifest themselves in a range of higher input costs including staff and property costs. As noted above, through the MFF, the London NHS Trusts such as UCLH receive 25−30 per cent higher reimbursement than the national average to reflect their higher costs of service. The CC itself has acknowledged the different cost profile of HCA due to the location of its facilities and that, *"local/regional variations in (some) input costs, are likely to have a significant impact on prices for HCA relative to the other four largest operators".*[257]

4.143 The gap between HCA and other operators in this analysis, simply cannot be explained with a reference to alleged differences in bargaining power. There are clear cost, treatment mix and quality differences that can fully account for any differential between operators. Furthermore the CC's view that differences between these indices are indicative of different bargaining power seems inconsistent with the evidence. Specifically, BMI is identified by the CC as owning a number of solus facilities, while HCA has none. If this was an important driver of bargaining power affecting this index significantly, the value taken by the indices would likely be different.

[256] CC, Provisional Findings, para. 6.212.
[257] CC, Provisional Findings, para. 6.212.

ANNEX A: The construction of the statistical test

Let $I(i,h)$ be the hypothetical expense that insurer *i* would incur should it buy its entire requirement from hospital operator *h*. More formally, this hypothetical expenditure is calculated as follows:

$$I(i,h) = \sum_{\{treatments\ in\ basket\}} N_t p(i,h,t)$$

Where N_t is the overall number of patients of insurer *i* for a certain treatment *t* and $p(i,h,t)$ is the average price of treatment *t* at hospital *h* for treatment *t*.

In order to test whether the hypothetical expenditure of insurer *i* to hospital operator 1 is statistically different from the hypothetical expenditure from hospital 2, a test statistic has been constructed as follows:

$$t = \frac{I(i,1) - I(i,2)}{\sqrt{\sigma_I^2(i,1) + \sigma_I^2(i,2)}}$$

Where $\sigma_I^2(i,h)$ is the variance of the hypothetical expenditure, calculated as follows:

$$\sigma_I^2(i,h) = \sum_{\{treatments\ in\ basket\}} N_t^{\ 2} \sigma_p^2(i,h,t)$$

In other words, the variance of the hypothetical expenditure is a weighted variance of the variances of the average prices of the treatments included in the basket, in which the weights, N_t, are the number of patients of insurer *i*, for treatment *t* across all hospital operators.

The test is distributed as a Student's *t* with degrees of freedom defined by the following formula below:

$$d.f. = \frac{\left(\sigma_I^2(i,1) + \sigma_I^2(i,2)\right)^2}{\Sigma_{\{treatments\ in\ basket\}} \frac{\left(N_t^{\ 2}\sigma_p^2(i,1,t)\right)^2}{N_t - 1} + \Sigma_{\{treatments\ in\ basket\}} \frac{\left(N_t^{\ 2}\sigma_p^2(i,2,t)\right)^2}{N_t - 1}}$$

ANNEX B: Results of Statistical Significance tests

[redacted]

5. APPENDIX 5: PROFITABILITY

Introduction

5.1 The CC has undertaken a profitability analysis of certain private healthcare providers in order to assess whether there is any evidence of market power and barriers to entry.

5.2 The CC notes in its Guidelines that, "*profitability can be a useful indicator of the competitive conditions in a market. An efficient firm in a competitive market would generally be able to earn no more than a 'normal' rate of profit—the minimum level of profits required to keep the factors of production in their current use in the long run, i.e. its rate of return on invested capital for a particular business activity would be equal to its cost of capital for that activity*".

5.3 In undertaking its profitability analysis the CC has assessed the Return on Capital Employed (ROCE) for seven private healthcare providers and estimated the Weighted Average Cost of Capital (WACC) for a generic UK private healthcare provider.

5.4 In the PFs, the CC concluded:

"*Our profitability analyses …… indicate[s] that BMI, HCA and Spire have, during the period under review (ie between January 2007 and June 2012) earned returns substantially and persistently in excess of the cost of capital. These firms account for more than half (53 per cent) of the private healthcare industry, indicating that the industry as a whole is likely to be making excess returns on average. …. [I]n the absence of barriers to entry, a new entrant could expect to produce strong returns. The extent of entry at the full service hospital level …is less than we would expect were there not high barriers to entry…. We therefore find that our profitability analyses suggest that there are high barriers to entry*".[258]

5.5 HCA fundamentally disagrees with the CC's findings on profitability. In particular, HCA disagrees with the CC's view that:

- HCA has earned "*returns substantially and persistently in excess of the cost of capital*";[259]
- The returns earned by the firms assessed by the CC "*indicate there are some limitations in the competitive process*";[260]
- "*The industry as a whole is likely to be making excess returns on average*";[261] and
- "*The difference between the replacement cost of the assets… and the market value of those assets… indicates that there are likely to be significant barriers to entry in the private hospital sector*".[262]

5.6 HCA shows in this Appendix that the CC's calculation of ROCE and WACC is incorrect and that any gap between them is entirely consistent with a competitive market where investment and innovation play an important role.

[258] Para. 6.86.
[259] Para. 6.282.
[260] Para. 6.283.
[261] Para. 6.86.
[262] Para. 6.285.

5.7 In HCA's view, its profitability is simply the measure of HCA's current relative success in the market, which in turn is the result of a track record of innovation, continual risky investment with a constant focus on providing the highest quality standards and patient outcomes which have enabled it to earn returns that are wholly consistent with a competitive market.

5.8 Furthermore, as outlined in section 6 of this response, HCA strongly disagrees with the CC's assessment of barriers to entry and expansion in the context of the central London market. HCA has presented evidence of recent entry and expansion in London in addition to setting out evidence of likely entry and expansion going forward. The CC is not justified in its finding that its profitability analysis suggests high barriers to entry. On the contrary, the evidence is that HCA is an efficient and high quality provider, it invests intensively, its services are highly attractive to consumers/patients, and entry and expansion are not subject to high entry barriers. Such a firm operating in a growing and competitive market would not be expected to achieve only average profitability.

5.9 HCA's response to the CC's profitability analysis is set out in this Appendix. HCA strongly contends that the CC's analysis and interpretation of its results are flawed for a number of reasons, as outlined below.

The CC's calculation of HCA's ROCE is flawed and significantly overstates ROCE

5.10 HCA considers that the CC's base case average ROCE of [✂] should be reduced to a range of [✂], with a base case of [✂], to take account of the following flaws in its calculations:

- The CC should apply the most appropriate alternative use in valuing its property portfolio taking into account actual market conditions which clearly indicate that a residential rather than office alternative use is realistic. This approach would reduce the CC's base case average ROCE by [✂];
- The CC should include the cost of freehold fittings and refurbishment in the mean capital employed calculation, reducing the CC's base case average ROCE by [✂]; and
- [✂] and the costs associated with holding working cash balances which, if included, would reduce the CC's base case average ROCE by [✂] and [✂] respectively.

5.11 The impact of these adjustments to the CC's calculations of average ROCE is shown in **Figure** A5.1 below.

[✂]

Figure A5.1 HCA's estimate of five-year year average ROCE (2007-2011)

Property Valuations

5.12 The ROCE calculation is highly sensitive to the assumptions made in valuing HCA's property portfolio. In addition to the KPMG valuation which estimated HCA's capital employed at 31 Dec 2011 at [✂],[263] HCA has calculated two additional valuations, first, by amending the CC's base valuation based on AEH valuations to correct errors and apply a range of reasonable assumptions; and secondly, using recent property prices in the market for

[263] KPMG, HCA International Ltd – London Hospital Portfolio – 02/04/13.

suitable buildings for conversion to potential hospital use in central London. These are shown in **Figure** A5.2 below.

[✂]

Figure A5.2 HCA property valuations – as at 31 December 2011

5.13 **Figure** A5.2 shows that the CC's base case valuation significantly underestimates the value of HCA's property portfolio.

5.14 The CC's own base case valuation calculations require adjustments to correct floor space assumptions and reflect more appropriate assumptions on property rental yields and developer's margins. After these adjustments, the CC's base case property valuations are in the range of [✂] (reducing the CC's base case average ROCE from [✂] to between [✂]).

5.15 A valuation based on the costs of converting properties which have come onto the market in recent years (and adjusting for depreciation and valuation dates) would suggest a comparable valuation of HCA's property of [✂] and an average ROCE of [✂].

5.16 **Figure** A5.3 below compares the ROCE implied by the various valuation methodologies described above (and including other adjustments included in HCA's base case calculation).

[✂]

Figure A5.3 ROCE estimates (average 2007-2011) – different valuation bases

5.17 In HCA's view, the ROCE associated with the KPMG valuation represents an appropriate base case against which to assess an appropriate WACC, but that any conclusion of excess profitability would need to be consistent with the [✂] ROCE based on the property costs facing a new entrant.

Leased Properties

5.18 In considering a ROCE approach to assessing profitability, HCA has concerns about CC's approach to treating leased assets in which ROCE results will vary significantly depending on which accounting standard is applied, and on the funding decisions of the firm. Such an approach cannot be regarded as robust. The CC's approach of only including leases which are capitalised on the balance sheet in its calculation of mean capital employed means that the value of HCA's assets was understated by up to [✂] in 2011. Correcting for this would reduce the ROCE by up to [✂]. HCA recognises that consistency would require the comparative WACC to also be amended to take account of the additional debt represented by the capitalised leases. HCA does not have the necessary data to make this adjustment for a UK market WACC, but, HCA estimates that the corresponding reduction in WACC would indicate a range of [✂] to be reasonable.[264] This would suggest that the CC's approach is likely to overstate any measure of excess profitability by up to approximately [✂]. The CC would need to take account of this issue before being able to conclude that the evidence suggested significant or persistent excess profits.

[264] The reduction in WACC will depend on the amount of leases included on the balance sheet. This figure is estimated by considering the potential impact of an increase in the gearing of our range of comparator companies. If we assume the current average gearing level of 58%, and the current asset beta of 0.89, the addition of [✂] of additional debt would reduce the estimated asset beta, which would in turn reduce the overall WACC to between [✂].

Intangible Assets

5.19 The CC's calculation of capital employed excludes the key intangible assets of relationships, reputation and know-how which are at the heart of HCA's business. The exclusion of any value for these intangible assets means that the CC's calculation of ROCE should be regarded as an overestimate. The market places a significant value on these intangible assets, as demonstrated by US market valuation multiples. Any assessment of whether or not HCA's profitability is consistent with a competitive market would need to take into account the value which the market would place on these intangible assets.

The CC has underestimated the market WACC and failed to recognise HCA specific factors which need to be taken into account

5.20 The CC's analysis includes:

- An inappropriately low inflation assumption;
- An ERP range that fails to take account of recent evidence on the market return; and
- A range of comparators that are inappropriate, for a variety of reasons, resulting in an implausibly low asset beta.

5.21 Correcting for the CC's errors, and, using the CC's methodology for estimating the WACC, we believe a reasonable range for the pre-tax nominal WACC is 11.7% to 14.0%.

5.22 If we also take into account an adjustment to the asset beta to allow for higher levels of utility-type government revenues in the US, we believe a range of 13.5% to 16.1% is appropriate.

5.23 Similarly, assuming an adjustment to the asset beta to reflect the results of the Fama-French model, HCA estimates the pre-tax nominal WACC to be in a range between 14.9% and 17.8%.

5.24 We believe there are merits to each of these ranges, and therefore we propose a reasonable overall range for the WACC of 11.7% to 17.8%, rather than the CC's range of 7.2% to 9.9%.

5.25 **Figure A5.4** below compares the estimates of ROCE and WACC prepared by HCA and the CC, including a number of scenarios for treatment of leased properties.

[✂]

Figure A5.4 HCA and CC estimates of average WACC and HCA ROCE for 2007–2011 for different valuation and lease capitalisation methodologies

5.26 **Figure A5.4** shows that the average ROCE for HCA for the period 2007–2011 for the three valuation methodologies (i.e. after correcting the CC's use of AEH valuation) is between [✂], all of which fall within HCA's estimate of the UK market WACC.

5.27 In addition, **Figure A5.4** shows that the inclusion of leased assets in the calculation of mean capital employed has the effect of reducing any gap between the ROCE and WACC.

5.28 In HCA's view, this analysis demonstrates clearly that the evidence on ROCE and WACC does not support the CC's conclusion that HCA has persistently earned excessive returns.

The CC's analysis is insufficient to assess how competition has played out in the market

5.29 In HCA's view, the CC's analysis of profitability:

- Does not meet the requirements set out in its own Guidelines and is insufficient in scope or duration to robustly conclude on levels of profitability in the market as a whole;
- Is insufficient to assess competition playing out in the market and therefore whether or not any firm or market level of profitability can be regarded as "excessive"; and
- Fails to assess the variability of profits across different firms or consider whether these could be due to legitimate factors consistent with a competitive market rather than a result of competition problems.

The CC has failed to consider whether or not HCA's profits could be the result of a successful strategy rather than market power or barriers to entry

5.30 HCA considers that:

- A reasonable estimate for the purposes of this investigation of its ROCE is the range [✂] and its WACC is 11.7% to 17.8%. On this basis, HCA's returns are entirely consistent with its cost of capital and the CC cannot conclude with any degree of robustness that its returns are excessive;
- Even if the CC concludes that there is a gap between its ROCE and WACC, any gap is clearly within the range of profitability which could be expected in a competitive market given the features of the healthcare market where HCA operates; and
- The CC has provided no evidence to support a conclusion that HCA's allegedly high level of profitability is attributable to barriers to entry or market power rather than the result of a successful business strategy of innovation, investment, and development of new markets.

5.31 In this submission, HCA provides evidence which clearly demonstrates that its success and profitability can be attributed to factors such as market cycles, innovation and efficiency, which the CC recognises as legitimate sources of high profit.

RETURN ON CAPITAL EMPLOYED (ROCE)

Key Points

- The CC's calculation of HCA's ROCE ([✂]) is flawed because:
  - It incorrectly assumes that the appropriate alternative use for HCA's properties is residential, not office, redevelopment;
  - It incorrectly excludes the costs of freehold fittings and refurbishment in its mean capital employed calculation; and
  - It incorrectly excludes the costs [✂] and the costs associated with holding working cash balances.
- When corrected, HCA's ROCE, based on the CC's methodology is estimated at [✂].
- HCA notes that this is an over estimate as the calculation does not take into account:
  - The correct treatment for leased assets; and
  - The significant intangible assets which HCA has built up over the years (reputation, experience, skilled workforce and relationships).

Introduction

5.32 In its PFs, the CC calculated HCA's average ROCE over the five-year period between 2007 and 2011 to be [✂].

5.33 HCA strongly disagrees with the CC's estimation of ROCE. This section sets out why HCA believes the CC's calculation of ROCE is incorrect in that:

- It has not used appropriate property valuations in its calculation of HCA's capital employed;
- It does not fully take account of the impact on profitability of leased assets; and
- It inappropriately excludes:
  - [✂]; and
  - The costs of holding working cash balances essential to the running of the business.

5.34 In addition, HCA has identified two errors in the CC's calculations:

- The CC has applied a property index to KPMG's valuations incorrectly (paragraph 5.78); and
- The CC has used AEH's land valuations without adjusting for the incorrect floor spaces used in these valuations (see paragraph 5.91).

5.35 HCA also notes that the CC's analysis inflates HCA's ROCE because it does not take account of:

- The full impact on profitability of leased assets; and
- The value of intangible assets.

5.36 After adjustments, HCA has estimated its ROCE over the period 2007–2011 to be in the range of [✂]. HCA strongly believes that it is appropriate to consider a range rather than a single point estimate, given the inherent uncertainties in several aspects of the methodology, in particular around the valuation of properties and intangible assets.

5.37 The CC's analysis fails to take proper account of HCA's substantial leased property portfolio. Including this reduces the ROCE by up to [✂], with a corresponding reduction in the WACC to [✂] indicating a reduction in any profitability "gap" of around [✂].

Property Valuations

5.38 HCA agrees with the CC's view that the correct methodology for valuing assets in the context of a competition analysis is to use the replacement cost of modern equivalent assets (MEA), after allowing for depreciation, but disagrees with the approach taken by the CC to estimate the appropriate depreciated replacement cost.

5.39 The CC's base case valuation is derived from valuations prepared by AEH which estimate the depreciated replacement cost of HCA's property assets at [✂] in 2011.

5.40 HCA disagrees with the CC's use of the AEH valuations for two main reasons.

5.41 First, AEH assumes that the relevant market price for a replacement property would be that of an alternative use of office accommodation – but the evidence clearly shows that the relevant property market for valuing HCA's sites is the residential market. HCA has provided the CC with a 2013 valuation, undertaken by KPMG and based on an alternative use of residential properties, of [✂].

5.42 Secondly, HCA disagrees with assumptions made in AEH's valuations relating to:

- Errors in floor space adjustments;
- Rental values which are too conservative;
- Yield assumptions which are too high; and
- Developers' margin which are too high.

5.43 Correcting for these errors suggests a valuation in the range of [✂].

5.44 HCA has also considered a valuation of its properties based on the cost of sites currently available and suitable for hospital facilities in central London, which suggests a comparable valuation for HCA's properties of [✂].

5.45 The results of the three approaches to valuation are compared to the CC's Base Case valuation in **Figure** A5.5 below.

[✂]

Figure A5.5 Comparison of Valuation Methodologies, implied December 2011 value

5.46 In HCA's view, the CC's valuation of [✂] substantially undervalues its property portfolio, and, if used in a ROCE calculation will significantly overstate the profitability of the company.

Alternative Residential Use and the KPMG valuation

5.47 In commenting on the KPMG valuations the CC stated that:

"*we agree with HCA that the value to the business of a hospital may be influenced by the feasible alternative uses to which that building could be put, since a new entrant would have to pay a price that at least matched that offered by those alternative uses*".[265]

5.48 The AEH valuation, used in the CC's Base Case, assumes that the relevant alternative use is office accommodation, and that the relevant market rent would be £40–50 per square foot. Residential floor rental values on the other hand would be in the region of [✂].[266]

5.49 HCA is firmly of the view that the appropriate alternative use assumption for valuing its properties is the residential market:

- Its properties are in highly sought after residential areas;
- In looking for new sites, it is competing against residential property developers; and
- There are examples of hospitals in London converting to residential use.

5.50 Examples of previous hospital sites being made available for residential redevelopment in London include:

- **NHS Queen Mary's Hospital, Roehampton**: services that were sparsely located across the site were moved to one side of the site. During a two-year development ending in 2006. The remaining buildings were demolished and the land was made available for residential development;[267]
- **NHS St. James Hospital, Balham**: the hospital was closed in 1988 and demolished to make way for private residential and care home properties on Old Hospital Close;[268]
- **NHS Atkinson Morley Hospital, Wimbledon**: services relocated to St. George's main site in 2003, and the site was bought by Berkeley Homes for a luxury homes development called Wimbledon Hill Park in 2010;[269]
- **The Middlesex Hospital**: closed in December 2005 with developers' plans to redevelop the site into a £1 billion 273-apartment luxury accommodation complex. The site was subsequently sold and in February 2012 Westminster City Council granted planning consent to build 300 homes at a cost of £750 million. The new development is now called Fitzroy Place and is an office, residential and commercial development of 95,000 square metres.[270]

5.51 In the PFs, the CC expressed two concerns with the KPMG valuations:

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[265] CC, PFs, A6(13)40, para. 109.
[266] Based on a valuation of [✂] (as per KPMG report) and a yield of [✂].
[267] http://www.pppforum.com/case-studies/queen-marys-hospital-roehampton
[268] http://www.sullivanthomas.co.uk/downloads/W_Balham%20Park%20Rd%20drop%20card.pdf
[269] http://www.berkeleygroup.co.uk/property-developers/berkeley/developments/wimbledon-hill-park/the-development/history
[270] http://www.mylocalelectrician.co.uk/blogs/train4tradeskills/2010/dec/noho-square-no-more-old-plans-scrapped-new-development

- KPMG's assumption that all of HCA's buildings would be able to gain residential planning permission; and
- KPMG's omission of affordable housing and section 106 costs.

In addition, the CC has incorrectly excluded the costs of fittings and refurbishments from the mean capital employed in its sensitivity using the KPMG valuation.

5.52 HCA has previously issued a note in response to the CC's technical questions on its response to the Working Paper[271] which covered these two issues. However, HCA notes that in the PFs, the CC seems to simply not have considered this information.

Planning permission

5.53 KPMG's property valuations assume that if planning permission is required for alternative use then such planning permission would be forthcoming and for a building size in line with the existing structures. This assumption was made in view of the factors that are generally taken into consideration by the authorities when considering planning applications, in addition to evidence of planning permission involving a change to alternative use being awarded in the areas in which HCA's properties are located.

5.54 Whilst there is no definitive list of considerations a planner might take in to account when considering an application for a change of a property's existing use to residential use, KPMG's report considered a number of factors including:

- Surrounding property uses: whether the granting of planning permission for residential use falls in line with existing surrounding building uses and character of the area in general;
- Supply versus demand: whether the current level of existing residential housing meets demand in the area. Planners will take into account the overall balance of supply and demand for housing; and
- Size of development: the existing property is indicative of that size of building that was previously considered appropriate for the site by the planning authority.

5.55 KPMG considered these factors in relation to HCA's property portfolio. In general, for each of HCA's properties, there is significant unmet demand for residential housing in the surrounding area – HCA's facilities are located in prime London locations.

5.56 Recent precedent for the planning authorities granting planning permission for conversion of properties to residential use in the Westminster borough (where the majority of HCA's facilities are located) has been reviewed. As there are limited examples of medical facilities being converted into residential buildings (other than in the immediate vicinity of Harley Street) planning applications involving the change of use of buildings were reviewed.

5.57 In the note sent to the CC on 7 June 2013, HCA included a list of planning permissions dating back to 2009 involving a change of use to residential. There are limited recent examples of applications for large scale buildings involving change of use within central London. However, in the two cases identified planning permission was granted. The application to use of parts of Soho car parks as commercial offices and residential was

[271] HCA's response to CC profitability questions, June 2013.

granted. The further application, also granted, was for a change of use and extension of use and extensions to 67–69 Whitfield Street to create 19 residential units; the erection of two additional floors and the partial change of use from office to residential to create 37 residential units[272].

5.58 Eleven further examples of planning applications for smaller buildings involving a change of use to residential were also cited. These included examples of properties on Harley Street and Wimpole Street with properties with existing medical use being granted permission for conversion to residential properties.

5.59 Of the planning applications reviewed, only one rejection of planning was identified: the planning for 16 Westbourne Street was rejected on technical grounds associated with whether the proposal constituted development. A planning application for this property involving a change of use to residential had already been granted and the extent of the subsequent amendment for which planning permission was sought was not deemed to constitute a development. HCA considers that the reasons for this decision – the only rejection – would not apply to the change of use of any of HCA's medical facilities.

5.60 Further consideration was also given to each of the individual HCA facilities in terms of the surrounding area and whether the granting of planning permission for residential use would fall in line with existing surrounding building uses and the character of the area in general. As detailed below, in each case it would be reasonable to assume that permission for residential use in the area would be granted.

- **Lister Hospital**: the hospital is situated in an affluent residential area with immediate surrounding property uses being residential. The site is ideally located for residential use given its proximity to the River Thames and Battersea Park and close proximity to Sloane Square and Victoria. Examples of recent planning permission being granted for conversion from non-residential to residential use in this area include the Chelsea Barracks scheme and, more historically, the adjoining residential units developed by Grosvenor.

- **Wellington Hospital**: the hospital buildings are situated in a mixed-use location. There is considerable high-end residential use of properties in the area. The site is ideally located for residential use given its proximity to Regents Park, St. John's Wood underground station and London's West End. Examples of recent planning permission being granted for residential development in this area include the Pavilion Apartments on St John's Wood Road and The Atrium on Park Road. Also, the development of a private residential element in the redevelopment of Lords Cricket Ground is being considered.

- **London Bridge Hospital**: the hospital is situated in a mixed-use location, with properties in the surrounding area being a mix of medical facilities, residential and offices. The site is ideally located for residential use given its frontage to the River Thames, close proximity to the City of London and being situated opposite excellent public transport links. Examples of planning permission recently being granted for conversion from non-residential to residential use in this area include Butlers Wharf fronting the River Thames and adjoining London Bridge. Furthermore, examples of recent planning permission being granted for residential development in this area

[272] http://idoxpa.westminster.gov.uk/online-applications/files/7EE4FD051C6B528D89CD4D82534A1395/pdf/11_00771_OBS--2045238.pdf

include the NEO Bankside adjacent to the Tate Modern Gallery and One Tower Bridge. The granting of planning permission for NEO Bankside in particular is important as it will adjoin a London landmark building in a prominent location. London's south bank and residential buildings offering a River Thames frontage are in high demand.

- **Princess Grace Hospital**: the hospital is situated in a mixed-use location, with properties in the surrounding area being a mix of medical facilities, residential, retail and offices. Marylebone High Street and the renowned medical district of Harley Street are in close proximity. The site is ideally located for residential use given its proximity to Regents Park, Marylebone High Street and London's West End. Examples of planning permission recently being granted for residential development in this area include the Triton Building in Regents Place.

- **Portland Hospital**: this hospital is also situated in a mixed-use location, including high-end residential use. The site is ideally located for residential use given its proximity to Regents Park, Marylebone High Street and London's West End. As noted, above in relation to the Princess Grace Hospital, there are examples of planning permission recently being granted for conversion to and from residential use in and around Harley Street, which is also in close proximity to the Portland Hospital.

- **88 Harley Street**: this facility is situated in a mixed-use location, with high-end residential properties and numerous medical facilities being located in the area. The site is ideally located for residential use given its proximity to Marylebone High Street and London's West End. As noted above, there are examples of planning permission being awarded for properties on Harley Street associated with the change of use from medical to residential.

- **HCA Laboratories**: the facility is situated in Wimpole Street. The immediate surrounding area includes medical premises, residential and offices. The site is ideally located for residential use given its proximity to Marylebone High Street and London's West End. Given the close proximity to Harley Street, the recent examples of planning permission being awarded for a change to residential use on Harley Street suggest that planning permission for residential use on Wimpole Street would also be forthcoming.

- **Devonshire Hospital**: the hospital is situated in a mixed-use location on Devonshire Street in the London borough of Westminster W1. Properties in the immediate surrounding area including medical premises, residential and offices. High-end residential use is prominent in the area and the site is ideally located for residential use given its proximity to Marylebone High Street and London's West End. The Devonshire Hospital is in close proximity to Harley Street and a number of other HCA facilities.

5.61 HCA acknowledges that Harley Street is designated as a Special Policy Area and criteria apply to the change of use of medical and associated uses to residential use. However, guidance notes[273] suggest that use will be approved if:

[273] http://transact.westminster.gov.uk/docstores/publications_store/planning/udp/UDP_Chapter_06_Social_&_Community_Facilities.pdf

- The character and function of the area would not be affected; and
- The loss of the medical use would not significantly affect the demand for that particular specialism.

5.62 HCA considers that these criteria would be met in the case of HCA's facilities given the range of alternative facilities that would be available to patients (both NHS and alternative private healthcare facilities). Furthermore, given Harley Street area's dual character as a residential and medical area, a change of use from medical to residential would not change the character and function of the area.

5.63 Given the evidence set about above, HCA considers it inappropriate to dismiss the KPMG property valuations on the grounds of the assumption adopted regarding planning permission being granted when there is clear evidence that this would be highly likely to be forthcoming.

Affordable housing and section 106 costs

5.64 In the PFs, the CC has expressed concern in relation to the assumptions in KPMG's valuations around social housing. Again, HCA considers that if the CC had considered the response that HCA had already made on this issue it would not have cited this as a reason for not adopting the valuations.

5.65 It is correct that KPMG's valuation does not make allowance for social housing requirements. However, this is considered a standard and reasonable assumption in valuations given that every planning application is judged on its individual merits. London Boroughs often set targets or guidelines for maximum affordable housing proportions when agreeing new residential developments. The existence and size of these targets depend on the size of the development. They are generally given in percentage floor space or as a percentage of units. This means it is difficult to estimate exactly what the effect on value for a development would be for a given requirement, given that the developer would be expected to devote the least prime areas of the development to affordable use and would seek to minimise the impact on value of any requirements imposed. Furthermore, public subsidy is sometimes made available through the council in order to fund the affordable housing requirement.

5.66 In reality, it is common for developers to negotiate a lower affordable housing percentage, or none at all. In this case the developer may make a negotiated cash payment into the borough's affordable housing scheme. For example, at the £400 million Neo Bankside development in the South Bank, the developers will pay £9 million to Southwark Council rather than provide affordable homes on site.[274] It is also common for developers to argue for the entire removal of the social housing obligation, on viability grounds. The relevant planning policies for London are contained in the London Plan produced by the Mayor of London. Policy 3.12 advises that:

"*The maximum reasonable amount of affordable housing should be sought when negotiating on individual private residential and mixed use schemes, having regard to:*

current and future requirements for affordable housing at local and regional levels identified in line with Policies 3.8 and 3.10 and 3.11,

[274] http://native-land.com/development-portfolio/neo_bankside and http://www.architectsjournal.co.uk/news/daily-news/affordable-housing-removed-from-rogers-neo-bankside-scheme/8616372.article

affordable housing targets adopted in line with Policy 3.11,

the need to encourage rather than restrain residential development (Policy 3.3),

the need to promote mixed and balanced communities (Policy 3.9)

the size and type of affordable housing needed in particular locations

the specific circumstances of individual sites.

B Negotiations on sites should take account of their individual circumstances including development viability, the availability of public subsidy, the implications of phased development including provisions for re-appraising the viability of schemes prior to implementation ('contingent obligations'), and other scheme requirements.."..[275]

5.67 In this context, HCA notes that in a recent High Court Appeal case relating to an affordable housing decision in London, the decision on whether or not affordable housing obligations would be required depends on the particular development proposal. This means that it is not possible to robustly estimate what, if any, cost for affordable housing would apply to any particular property in the absence of an analysis of the specific redevelopment plans. As noted by a law firm:

"*The short point arising from this decision would appear to be that if a developer has credible evidence supported by respected witnesses that a scheme would not be viable with an affordable housing requirement, it may well be able to avoid having to provide affordable housing even if its figures are disputed by the local planning authority. This is likely to strengthen developers' hands considerably when it comes to negotiations with local planning authorities on whether a scheme should provide affordable housing (and, if so, as to the amount)*".[276]

5.68 HCA's hospitals vary in size (some are below the affordable housing threshold, for example 88 Harley Street and HCA Laboratories) and location, meaning that the application of the affordable targets would vary considerably if indeed they even applied and would in any case be subject to negotiation. In the face of this general uncertainty, it is extremely hard to estimate the total effect on value. The potential impact on the value of HCA's specific property portfolio is not likely to be significant, especially when considered in light of other conservative assumptions adopted in the valuations.

5.69 As highlighted to the CC previously, the KPMG property valuations are conservative. For example, in the valuations the major assumption that the developers would develop the sites into residential properties of the same floor size as the existing buildings was used. In reality, developers would in all likelihood pursue a development of larger floor area in the vast majority of cases. This could be done, for example, by adding height to the building, by expanding the footprint of the building on the site, or by increasing the number of floors in the building whilst keeping the total height the same. Whilst this might not be possible at a small number of locations – for example some of the Harley Street properties – and it might increase the complexity of the planning application, increasing the assumed size of the development could add significantly to the theoretical market value of the properties. The methodology is therefore conservative.

[275] http://www.london.gov.uk/priorities/planning/london-plan
[276] See for example, this analysis:
http://www.fladgate.com/pubs/xprPubDetail.aspx?xpST=PubDetail&pub=428

5.70 Notwithstanding the above, HCA has undertaken a sensitivity analysis on the KPMG valuations, looking at each property individually and assuming that the maximum social housing cost requirements were applied in each case, with the full impact being deducted from the valuation. These suggest that costs associated with a conversion of HCA's properties would result in a reduction in the valuations of [✂] of the total valuation. However, based on precedents, it is highly unlikely that the maximum provision would be applied to any, and certainly not all, of HCA's properties and so this represents an upper bound to the impact.

Fittings and refurbishment

5.71 Refurbishment and fixtures and fittings are capitalised on HCA's balance sheet to reflect the investment made into its property portfolio.

5.72 The CC has excluded the costs of freehold building improvements and refurbishment from its alternative use valuations (both AEH and KPMG), arguing:

"*we consider that the inclusion of construction in progress and freehold building improvements and refurbishments, as well as the associated depreciation charges on the latter is inappropriate when applying an alternative use value to the buildings. The addition of a theatre or an imaging suite, for example, is unlikely to have an impact on the alternative use value of the building. Nor does the wear and tear of such assets reduce the alternative use value of the building (which is based on the conversion of the building to apartments). Hence, we do not agree with HCA's view that refurbishments should be capitalized as investments in the business separate from the market value of the properties where those properties are valued with reference to alternative use. Rather, we consider that this approach 'double counts' elements of HCA's capital employed and understates profits*".[277]

5.73 Both AEH and KPMG valuations are effectively valuing the land plus building asset for conversion and therefore exclude the costs which a developer would incur in refurbishing the property for an alternative use – therefore including them will not "double count" the costs as the CC argues the value of the building in use should include the costs of conversion and therefore needs to include these additional refurbishment costs.

5.74 In HCA's view, the CC's argument is wrong. The costs of fitting out a hospital must be included in any calculation of economic returns, in order for the result to be meaningful. The reason for this can be considered from both HCA's perspective and that of a potential new entrant. Simply put, given the high value of property in central London, HCA continually faces an investment decision – carry on operating a property as a hospital (and incurring refurbishment costs) or sell to a property developer for conversion to residential use – and that represents the relevant opportunity cost.

5.75 Similarly, a new entrant would need to (a) buy a suitable property (competing against residential developers and (b) incur the costs of refurbishing that building to hospital standards. The new entrant would clearly need to recover both costs in order to generate a return.

5.76 In particular on point (b), the KPMG valuations account for the costs of converting a hospital building into a residential property. This is the fundamental point of residual value estimations, where the developer is only prepared to pay a price at less than the full

[277] CC, PFs, A6(13)54, para. 146.

development potential in order to take profit and conversion costs into account. By omitting freehold refurbishments, fixtures and fittings from the analysis, the CC is effectively double counting the omission of any operational fixtures from HCA's properties portfolio. It has not included the refurbishment costs of the prospective residential developer, and it has not included the refurbishment costs of HCA's hospital operations. Effectively, the CC has only included the valuation of empty property shells.

5.77 The net book value of fittings and refurbishments of HCA's freehold properties in HCA's accounts amounts to [✂] at Net Present Value over the period 2007–2011. Including this in the ROCE calculation that utilises the KPMG valuations reduces the average ROCE over the period 2007–2011 by [✂].

Indexing of KPMG property valuations

5.78 In its sensitivity based on the KPMG valuations, the CC applied a property price index to derive historical valuations. HCA notes two fundamental errors in the CC's application of the index for calculating the KPMG land and buildings valuation:

- **Lister Hospital and Wellington Hospital local authorities**: both the Lister Hospital and the Wellington Hospital are both located in the City of Westminster, not in Kensington & Chelsea and Camden as assumed by the CC in its profitability model respectively.

- **Initial Year of Indexing**: the CC chose 2006 as its initial year from which to apply the House Price Index to the KPMG valuations. The choice of 2006 appears to be arbitrary as the CC's analysis of ROCE reports capital employed in the first of the years 2007 to 2011 as at December 2007. House prices increased by between 15 and 20% between December 2006 and December 2007. In comparison, house prices between December 2007 and December 2011 only increased by 16%. Therefore, between December 2006 and December 2011 they increased by 42%, overstating the gains in property value between December 2007 and December 2011 (the majority of value gained was during 2006). In reality, the CC must follow the principles of Mean Capital Employed when calculating ROCE. This is because a mean capital employed best reflects the value of a firm's assets over the course of the study year, as opposed to a year end capital employed. HCA has therefore adjusted the CC's analysis to reflect a mean capital employed in 2007 and a mean capital employed in 2011 in order to calculate the relevant property values in the years 2007–2011.

AEH Valuations

5.79 HCA has previously expressed concerns about the AEH valuations. HCA explained in its note of 1 February 2013 why they are inappropriate for the purposes of the CC's profitability analysis – primarily because the AEH approach assumed a low-end value of the properties excluding any alternative use. HCA maintains that the underlying AEH methodology is inappropriate for the purpose of calculating a ROCE.

5.80 In addition to its concerns about the underlying methodology of the AEH valuation, HCA has concerns about the specific assumptions used in the AEH land valuations:

- Unevidenced market rent assumptions;

- High yield estimates; and
- High developer's profit margin required.

5.81 Addressing these concerns could potentially increase the AEH valuations by up to [✂].

The AEH land valuations understate market value

5.82 In its base case ROCE calculations the CC used the AEH valuations. The AEH valuations calculated the depreciated replacement cost of HCA's buildings, using its own estimates of floor space in the properties. AEH also calculated the land value of HCA's properties by calculating the market value of an office development and removing the construction costs and developer profit margins to estimate a residual land value. AEH also estimated the market value of the combined land and buildings of a series of smaller properties. The CC amended the AEH depreciated replacement costs by removing the AEH's estimates of depreciation and replacing it with the Valuation Office Agency's estimates from valuations carried out in 2008. The CC estimated HCA's property portfolio to be between [✂] between 2007 and 2011, of which [✂] was the land value of HCA's main properties.

5.83 As set out above, HCA disagrees with the use of AEH's valuations in the ROCE calculations and considers that the KPMG valuations are more appropriate given that they reflect alternative use and HCA's economic opportunity cost of holding the properties. Furthermore, HCA has significant concerns with AEH's approach to land valuation.

5.84 AEH's approach to estimating land valuations involved the following steps:

- Estimating the sale of an office development, at an assumed market rent and yield;
- Estimating the construction costs to create that development; and
- Estimating the profit required by the developer.

5.85 HCA notes that the residual land value was calculated by subtracting the construction cost of the hypothetical building and the profit required away from the sale price of the development.

5.86 HCA has a number of concerns with the AEH valuation methodology for its valuation of land. In particular:

5.87 **Rent per square foot**: AEH assumed a rental value of [✂] for all properties apart from Wellington, which was valued at [✂] per square foot. This figure was the basis of the market value from which the residual land value is calculated. [✂] is a considerable underestimate for the following reasons:

- A review of current rents for comparable purposes has identified a range of rates for commercial office rent ranging from £33 to £93 per square foot.[278] These reports,

[278] HCA undertook an exercise sourcing reports on the commercial rental market in central London. Reports were dated 2012 or 2013, issued by Knight Frank, Jones Lang LaSalle, Carter Jonas, Lambert Smith Hampton and GVA. This is seen in the case of brand new commercial developments in central London. 10 Portman Square is a 134,000 square foot commercial development by British Land, commanding a quote price of £90 per square foot (located in the heart of the North of Oxford Street area, the same as HCA's Harley Street facilities and also the Princess Grace / Devonshire Hospital sites).

carried out by real estate companies who frequently benchmark rental values, often present lower and upper range estimates. One example of this is a Carter Jonas' report[279], which reported a range of office rental values on the commercial property market dated March 2013. It identified various ranges for commercial rent, but given that AEH's land valuations were based on a hypothetical new office building, HCA considered the range for new or completely refurbished buildings to be most appropriate in this context. HCA applied these location-specific ranges to the areas in which the various HCA hospitals are located. This resulted in a range from £42.50 for the London Bridge area to £69.50 for the Marylebone and Fitzrovia areas.

HCA Hospital	Carter Jonas Geographical Area	Minimum Rent £/Sq Ft.	Maximum Rent £/Sq Ft.
Lister	Victoria Secondary	46.5	55.0
London Bridge	Southwark Prime River	42.5	49.5
Portland	Fitzrovia	55.0	69.5
Devonshire	Marylebone Secondary	52.5	
Princess Grace	Marylebone Secondary	52.5	
Wels lington	Paddington	52.5	57.5

Table A5.1 Carter Jonas range of rents per square foot

- The rates only consider commercial/office use as the alternative option, whereas for all of the areas in which HCA's properties are located, residential development is the most likely alternative use, as stated by KPMG in its property valuation report[280]. The most appropriate technique is to use residential comparators, where sale values in new developments can reach [✂][281], giving an indicative rent of [✂] if a [✂] yield were applied.

5.88 The rents used are supported by an analysis of rents in the central London areas in which HCA hospitals operate are set out in **Table** A5.2 below.

Property	Rent (£ per square foot)
1 & 2 Fitzroy Place	85.0
1 Pancras Square	55.0
2 Pancras Square	55.0
Fitzroy House, 355 Euston Road, London, W1	53.5
Africa House, 70 Kingsway, WC2	62.5
10 Bloomsbury Way	60.0

http://www.britishland.com/our-properties/development.aspx#/committed_developments/11401, http://www.estatesgazette.com/propertylink/advert/10_portman_square_w1h_6az-10_portman_square_w1h_6az-3474715.htm

[279] http://www.carterjonas.co.uk/en-GB/news-and-events/news-and-press-releases/march-13/~/media/Publications/Commercial%20Edge%20London%202013.ashx

[280] Response to the Working Paper, Appendix 4.

[281] According to benchmarked properties listed in KPMG's valuation of HCA's property portfolio.

20 Bentinck Street	89.5
95 Wigmore Street, London, W1	83.5
10 Portman Square	90.0
The Wimpole Building	60.0
42–50 York Way	45.0

Table A5.2 Property rents in the vicinity of HCA's properties in central London

5.89 **Yield**: AEH applied property yields of between [✂]. In central London, property yields often dip much below [✂], and property yields can fall to 3.75%[282]. A report by GVA[283] listed commercial property yields of between 5.0% and 5.5% for the areas within which HCA's property portfolios lie. Applying these yields instead of the AEH assumed yield leads increases land valuations by up to [✂].

5.90 **Developer's profit margin required:** AEH assumed a conservative required profit margin of [✂], whereas the KPMG valuations assumed a [✂] profit requirement. Applying the KPMG assumption increases land values by up to [✂].

5.91 **Floor space:** HCA has previously highlighted incorrect floor space estimates used by AEH in its valuations[284]. The correct floor spaces are the Valuation Office Agency floor areas (as used for the KPMG valuations)[285], taking into account the need to use Net instead of Gross area for the valuation of the building for commercial use. Some of the floor space underestimates are significant.

- The total gross internal area for the Wellington, for example, is [✂] for the north, south and central building. In consideration of its land valuations, AEH has only used an estimated total gross internal area of [✂]. The resulting net internal area used by AEH allows for a very conservative [✂], which is below the [✂] gross to net ratios used by KPMG in its valuations of HCA's property portfolio. Even in the case of applying the conservative [✂] used by AEH in its valuations, the correct net floor space for Wellington equates to [✂], which is significantly more than the [✂] used by AEH for its land valuation of Wellington.

- Across the property portfolio, AEH appear to have omitted [✂] of HCA property from the total gross internal area in its land valuation. Correcting for these omissions potentially increases the value of HCA's land by [✂] more than AEH's original valuation of [✂].

- Additionally, HCA believes that a [✂] is an underestimate of the potential rentable space in a property. HCA considers a total gross to net ratio of [✂] identified by KPMG to be a figure that is more suitable.

- Overall, HCA is concerned that, whilst the CC has looked into the floor space issue with regards to the building values, it has not investigated the same issue with respect to the residual land values. As a result, the CC presents incorrect capital employed figures for HCA from using the incorrect floor space alone.

[282] Prime yields for Mayfair, GVA Research Report, Central London Briefing, Q2 2013.
[283] GVA Research Report, Central London Briefing, Q2 2013.
[284] As noted by the CC in PFs, A6-13(52), para. 142.
[285] VoA floor areas were also used for the DTZ valuations commissioned by DTZ.

5.92 **Table** A5.3 below shows the potential range of valuations of HCA's land, depending on the assumptions used in AEH's approach.

AEH land valuation		[✂]
CC's 2011 value of buildings		[✂]
Correction of errors	Correction of floor space	[✂]
	Correction of net to gross area ratio	[✂]
Plausible range for assumptions	Rental value (per square foot)	[✂]
	Yield	[✂]
	Developers' margin	[✂]
Other AEH properties at market value		[✂]
Total		[✂]

Table A5.3 Valuation of HCA's Property Portfolio

5.93 As shown in **Table** A5.3 applying different plausible assumptions for the valuation of HCA's property portfolio can generate a significant range of land valuations.

5.94 In HCA's view, for the purpose of profitability analysis in a market investigation, any findings of "excessive" profitability would need to be based on the most favourable set of assumptions – in this case the higher valuations – in order for them to be robust.

Current Cost of Entry

5.95 An alternative source of suitable valuation benchmarks is provided by the costs of converting sites which have come onto the market.

5.96 The following examples illustrate the potential cost of sites available for new entrants and that a residential use valuation is appropriate:

- [✂].
- [✂].
- [✂].
- [✂].[286]

5.97 **Table** A5.4 below shows the costs of acquiring and converting these sites and using the average of these to calculate a comparable depreciated replacement cost valuation for HCA's properties.

[✂]

[286] Source: HCA.

Table A5.4 Valuation of HCA properties based on alternative sites

5.98 **Table** A5.4 shows that applying current prices for alternative hospital sites in London, and taking into account conversion costs the comparable value for HCA's properties as at December 2011 is [✂].

Leased Properties

5.99 In considering whether or not leased properties should be included in the calculation of the firm's capital employed, the CC states that:

"*Our approach to the recognition of these assets has generally followed the accounting treatment adopted by the operators, i.e. where the parties have capitalized a building on their balance sheet, we have also do[ne] so*".[287]

5.100 Approximately [✂] of HCA's property (by area) is held under leases which are not capitalised on its balance sheet, and therefore not included in the CC's calculation of mean capital employed. The financial accounting treatment to only capitalise very long leases reflects the current accounting standard for leased assets which applies a number of tests to determine whether leased assets are included on the balance sheet.

5.101 In HCA's view there are two problems with this approach:

- First, the accounting treatment for leased assets involves a degree of subjectivity and is therefore, to some extent, arbitrary; and
- Secondly, the results of the ROCE analysis will vary substantially for different property financing structures which suggests that a consistent approach to financing assumptions is required in order to generate robust results for a competition analysis.

5.102 The problems associated with using accounting based approaches to leased assets has also been discussed in a recent article by Gregory & Whittaker (2013) in the Journal of Business Ethics: different firms within the same industry can employ different methods of operation, which in turn affects their asset composition and cost structures. This article cites an example from the UK retail industry: "Next plc has a tendency to rent its retail outlets, whereas Marks and Spencer plc are inclined to own their outlets. Both firms are of roughly similar size in terms of market capitalisation, with Next plc having an end December 2011 market value of £4.6 billion and Marks and Spencer plc having a market capitalisation of £4.89 billion. Yet Next's property, plant and equipment balance sheet value totals £592 m, with a net book value of equity of just £232 million, whereas Marks and Spencer have a property, plant and equipment total of £4.678 billion and a net book value of £2.674 billion. The price to book ratio of Next is over ten times that of Marks and Spencer, and its return on equity (ROE) is 409.6% compared to Marks and Spencer's 24.01%. While there may be genuine valuation differences in efficiency, prospective cash flows and hence market valuation between these two companies, there is no doubt that a very large part of the difference between the ROE and price to book ratios of the two firms is attributable to their different operational models.

[287] CC, PFs, A6(13)-21, para. 58.

Accounting Standards and treatment of leased assets

5.103 In financial accounts, the classification of a finance lease is based on whether the risks and rewards of ownership have transferred. In practice, HCA applies SSAP 21 Accounting for leases and hire purchase contracts, which includes a number of tests in order to determine whether or not to include a leased asset on the balance sheet. Leases are classified as finance or operating leases using SSAP 21, and only finance leased assets are included on the balance sheet (but the standard notes that "In practice all leases transfer some of the risks and rewards of the asset and the distinction is one of degree").

5.104 The key test is:

"*It should be presumed that such a transfer of risks and rewards occurs if at the inception of the lease, the present value of minimum lease payments is substantially all (normally 90% or more) of the fair value of the leased asset*".

5.105 The test is rebutted if:

"*...it can be clearly demonstrated that the lease in question did not transfer substantially all the risks and rewards of ownership e.g. if there is significant residual market value at the termination of the lease*".[288]

5.106 In this context, HCA notes that a strict application of the 90% rule would imply an additional [✂] of assets being included on HCA's balance sheet.

5.107 The current approach has been criticised as being arbitrary and leading to inconsistent results. In the US for example, The Report and Recommendations Pursuant to Section 401(c) of the Sarbanes-Oxley Act[139] criticises lease accounting standards for having off balance sheet implications.

"*The 'all-or-nothing' nature of the guidance means that economically similar arrangements may receive different accounting [treatment]*".

5.108 In response, the International Accounting Standards Board (IASB) and the United States Financial Accounting Standards Board (FASB) initiated a joint project to overhaul the lease accounting standards, aimed at providing greater transparency about the assets an organisation uses. In the preface to their report they highlight the issue.

"*…those models have been criticised for failing to meet the needs of users of financial statements because they do not always provide a faithful representation of leasing transactions. In particular, they do not require lessees to recognise assets and liabilities arising from operating leases. As a result, there has been a longstanding request from many users of financial statements and others to change the accounting requirements so that lessees would be required to recognise those assets and liabilities*".[289]

5.109 Based on the draft exposure, all operating leases over 12 months will be taken to the balance sheet as "Right-of-use assets" at the net present value of future obligations under the lease.

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[288] See section III.D.2 of the Report and Recommendations Pursuant to Section 401(c) of the Sarbanes-Oxley Act of 2002 On Arrangements with Off-Balance Sheet Implications, Special Purpose Entities, and Transparency of Filings by Issuers.

[289] See para. 1 of the Introduction to the IFRS Leases Exposure Draft, May 2013.

5.110 Damadoran, in his papers on leasing and profitability, has considered this discrepancy between the presentation under current accounting standards and the economic reality of a lease transaction.

"*Many firms that use long-lived, expensive assets for their operations have a choice of either buying these assets, often borrowing a significant portion of the costs, or leasing them. Since the firm puts the assets to use, generating revenues and operating profits, in either case, it seems logical to consider leasing as a financing choice and leasing costs as financing costs. Unfortunately, both US and international accounting standards choose to ignore this logic and allow a significant portion of lease expenses to be treated as operating expenses. Consequently, the operating income of a firm that has significant operating lease expenses will be misstated, as will the reported book values of debt and capital. If we use these reported numbers in analyzing the firm, we will arrive at skewed estimates of profitability, leverage and value".*

"*Rather than wait for accounting statements to reflect reality, we should be making these changes already, when analyzing companies. …., we should be doing what is right in valuation and corporate financial analysis, rather than bending our assessments to fit accounting rules that do not make sense".*

"*While accountants and the tax authorities may differentiate between capital and operating leases, we see no reason for the differentiation in corporate finance and valuation*".[290]

5.111 Damadoran suggests taking all leases to the balance sheet (in line with the proposed changes to the accounting standards). He notes that the intangible "Right to use asset" has a value which should be recognised in calculating the capital employed.

"*The accounting distinction between capital leases (which are recorded as debt) and operating leases (shown as operating expenses) is built around where the ownership of the leased asset effectively resides. In this paper, we have argued that the key determinant of whether an expense is an operating or a financial expense is not ownership rights but the nature of the cash flow claims associated with a transaction".*

5.112 In order to avoid the distortions to the ROCE, which would arise if an arbitrary and arguably flawed accounting approach to leases is applied, one approach would be to capitalise all of HCA's leased property assets at the net present value of the remaining obligations under the lease. This approach would have a number of benefits:

- It would mean that the ROCE does not vary with particular accounting treatments and reflects the latest proposed treatment by the IASB and FASB:
- It recognises the long term nature of the leased assets on the balance sheet;
- It is consistent with the risk profile used by the market to price the firm's equity;
- It reduces the dependency of ROCE to the particular funding structure adopted by different firms; and

[290] Leases, Debt and Value Aswath Damodaran (Kerschner Family Chair in Finance Education and Professor of Finance at New York University Stern School of Business) April 2009 and Return on Capital (ROC), Return on Invested Capital (ROIC), and Return on Equity (ROE): Measurement and Implications, Aswath Damodaran (Kerschner Family Chair in Finance Education and Professor of Finance at New York University Stern School of Business) July 2007.

- This approach is consistent with the treatment proposed in the Exposure Draft on Leases.

5.113 HCA's decision to lease a property for a particular term typically reflects the lessor's requirements and where possible, HCA secures the longest lease available. [✂]. These lease arrangements could therefore be interpreted as akin to a competitor's decision to purchase property.

5.114 HCA strongly considers that the calculation of ROCE in the context of a competition analysis should not be critically dependent on decisions relating to the financing of its property portfolio. In HCA's view there is therefore a good argument for including the market value (rather than the present value of the remaining obligations) of all leased assets in the capital employed calculation. One method of calculating the market value of the leased properties is to calculate the net present value of current rental payments, discounted to perpetuity.

5.115 Such an approach would eliminate any distortions in the profitability analysis arising from the lease/buy decisions of different firms, which should not have a material impact on the relevant measure of profit for a competition analysis.

5.116 In HCA's view, the nature of these leases and HCA's intention to continue to occupy all of its major leased sites for the foreseeable future effectively mean that the correct interpretation of "capital employed" has to be one which includes these significant and critical assets at the heart of its business. **Figures** A5.6 and A5.7 show the impact on asset value and ROCE of the various lease capitalisation scenarios.

[✂]

Figure A5.6 Asset value impact of lease capitalisation

[✂]

Figure A5.7 ROCE impact of lease capitalisation

5.117 Capitalising leases has implications for the calculation of the WACC, and in principle, the WACC should reflect the additional level of debt represented by the capitalised leases. However, this is not straightforward as the underlying asset beta would first need to be adjusted for the (probably unobservable) lease capitalisations for each of the analogue companies. HCA has estimated that the impact on the WACC of capitalising leases in the two scenarios discussed above would change the range of WACC from [✂] to [✂] respectively. This indicates that any "profitability gap" between ROCE and WACC can be expected to reduce by around [✂] if all leases are capitalised onto the balance sheet.

Holding gains and losses

5.118 The CC states that:

"*We consider that the increase in value of central London hospital buildings may represent a 'windfall' to these operators, which is unrelated to competitive conditions in the market for private healthcare. Hence although the increase in property values has been persistent, we have estimated the ROCE with these gains excluded from our analysis*".[291]

[291] CC, PFs, A6(13)-64, para. 173.

5.119 HCA agrees that holding gains arising from increasing property value should be excluded from the calculation of ROCE for the purposes of this competition analysis.

5.120 The treatment of holding gains and losses arising from revaluations depends on whether or not the accounts are prepared under the financial capital maintenance principle (in which asset specific holding gains on revaluation are included in the measure of "profit") or under the operating capability maintenance principle (in which asset specific holding gains are not included).

5.121 An Ofwat paper usefully summarises the difference as follows:

"*The ASC Handbook on 'Accounting for the effects of changing prices' (1986) discusses two alternative measures of a company's profits which can be summarised as follows.*

- *Real Financial Capital Maintenance ('FCM') is concerned with maintaining the real financial capital of a company and with its ability to continue financing its functions. Under real FCM, profit is measured after provision has been made to maintain the purchasing power of opening financial capital. This involves the use of a general inflation index such as the RPI. Real FCM therefore addresses the principal concerns of the shareholders of a company. In the absence of general inflation real FCM is equivalent to conventional HCA, with the exception of the treatment of unrealised holding gains (paragraph 1.8.11).*

- *Operating Capability Maintenance ('OCM') is concerned with maintaining the physical output capability of the assets of a company. Under OCM, profit is measured after provision has been made for replacing the output capability of a company's physical assets which involves the use of specific inflation indices such as the Construction Price Index (COPI) or the Baxter index. This will typically be a major concern for the management of a company and was the approach used in Statement of Standard Accounting Practice ('SSAP') 16 – Current Cost Accounting (this standard was withdrawn)".*[292]

5.122 In HCA's view, the Operating Capability Maintenance approach is clearly the most appropriate in order to assess whether or not a firm is earning excessive profits in the context of a competition analysis. There are three reasons for this.

5.123 First, any new entrant would price services based on the current cost of an asset, and not take into account any historic holding gains (and in a competitive market, any expected future increases in valuation would be captured in the current valuation).

5.124 Secondly, including holding gains in the analysis would mean that in principle, if the firm distributed its holding gains, it would not have the ability to replace the depreciating assets subject to the holding gains.

5.125 Thirdly, any windfall gains arising from property valuations arise from property investments decisions, and as such are outside the scope of this market investigation.

[✂]

[292] http://www.ofwat.gov.uk/publications/rags/gud_rag_1capmaint_105.pdf

Investments

5.126 In reference to paragraph 147 of the CC's profitability appendix, the CC has not included items on the balance sheet referring to investments outside of facilities in the scope of the investigation in its capital employed.

5.127 HCA believes that its investments in Rood Lane, the Physicians Clinic at Harley Street, Enhancecorp and HCA Purchasing represent a tangible asset value to the facilities within scope. These are capital investments made by facilities that should be considered as part of its active capital employed.

Intangibles

5.128 HCA notes that the CC has decided not include the value of most intangible assets such as training, know-how, marketing, reputation, and customer and consultant relationships. This is a fundamental problem with its analysis and affects how the profitability results can be interpreted.

5.129 Intangible assets are a critical element of HCA's business, and unquestionably part of its success. Any economic model of the HCA's assets or profits which ignored these assets clearly runs the risks of producing incorrect conclusions.

5.130 As noted by a US valuation firm:

"*Transactional activity [ie acquisitions] is not always operationally focused, and HAI has observed an increase in transactions focused on the underlying intangible assets of a hospital, including: licenses, certificates of need, trade names, and know-how. These intangible assets may serve as the focus in an outright purchase, and are also frequently licensed or used as a contribution to a joint venture. Utilizing a well-known and respected hospital name, having access to experienced and sub-specialized medical personnel, and relying on proven management procedures could result in less patient leakage, increased services offered to patients, increased revenues, and a more efficient operating structure for a subject hospital*".[293]

5.131 Further, whilst HCA recognises the CC's logic in attempting to avoid circularity in valuing intangible assets in a way that captures any future excess returns, where, as in this case, the market value of these intangible assets is significant, excluding them in their entirety will mean that the CC cannot draw any robust conclusions about excess returns.

5.132 In HCA's view, in considering whether or not a firm has made excess returns, it is necessary to factor into the analysis the market value of intangible assets which could be realised through a sale of the business. In the hospital market, any new entrant or existing operator seeking to expand has two options – build a new facility or buy one from an existing operator. In this context, the market value of hospital businesses in the US provides some useful data.

[293] Current Trends in Hospital Transactions, HealthCare Appraisers Inc (HAI), April 2013, page 5. http://www.healthcareappraisers.com/Publicationpdf/AHLA-Transactions-Current-Trends-Hosp-NJ-JR-0413.pdf

5.133 The average valuation multiple (Enterprise Value/EBITDA) of[145] "Medical Services" companies in the US was 6.02.[294,295] **Table** A5.5 below applies this multiple to the CC's estimate of HCA's capital employed in 2011.

	2011 (£ Thousands)
EBITDA	[✂]
- Intangible expenditure add-back	[✂]
- Rent to add back	[✂]
- Adjusted depreciation	[✂]
Adjusted EBIT	[✂]
Capital Employed	[✂]
EBITDA Multiple	[✂]
Implied Market Value	[✂]
Difference between Market Value and Capital Employed	[✂] [✂]

Table A5.5 Valuation multiples and MCE

5.134 As shown in **Table** A5.5, applying the US industry average valuation earnings multiple of 6.02 to the CC's calculation of HCA's EBITA for 2011 would imply a market value of [✂] compared to a capital employed of [✂], a difference of [✂].[296]

5.135 In HCA's view this difference is attributable to two factors: first an understatement of a realistic market value for HCA's properties and second the exclusion of a significant group of intangible assets.

5.136 The application of a market derived valuation multiple also explains why the CC's analysis fails to reflect the reality of the market. If, as the CC argues, HCA is earning excessive returns, and that a competitive level of return would be 8.6%, then based on the CC's calculation of HCA's capital employed, this would imply a competitive market EBITDA in

[294] http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/vebitda.html
[295] As these are based on quoted share prices, they will exclude any premium that would apply to the business as whole
[296] HCA notes that the valuation multiple of 6.02 is a conservative one, as it does not reflect any premium which would apply for control. The table below shows the multiples paid for hospital acquisitions in the US in 2013. In HCA's view, it would be reasonable to consider that [✂].

[✂]

Target hospital statistics for 214 acquisitions in the US 2010–2012, (Data compiled by Irving Levin) Associates)

2011 of [✂] compared to the CC's calculation of [✂]. Applying the market based average multiple of 6.02 to this EBITDA gives a market valuation of [✂] compared to the CC's estimate of HCA's capital employed of [✂], a difference of [✂].

5.137 This analysis demonstrates that the CC's approach of ignoring intangible assets which the market places a high value on means that its analysis cannot correctly assess whether or not returns are consistent with a competitive market.

5.138 In HCA's view, the CC's profitability analysis framework needs to be able to explain the market based valuations and their implications for the valuation of intangible assets if they are to be sufficiently robust to support the imposition of remedies.

5.139 Finally, HCA notes that if the CC decides to continue to apply its narrow approach to valuing intangibles, it must recognise this in interpreting its ROCE analysis, and in particular take into account that its approach is likely to significantly overstate the ROCE.

Cash Balances

5.140 HCA believes that a working cash balance is necessary for the operation of a hospital business. HCA included a value of average monthly staff costs for all clinical and administrative staff in its capital employed as part of its response to the Working Paper. This was a conservative assumption that was likely to understate the actual operational working capital requirements of the business which would include cash required for other day-to-day operations.

5.141 Whilst the CC acknowledged, in the PFs the argument that HCA and Spire had presented in relation to the requirement to hold a cash balance in order to cover any mismatches between the timing of cash inflows and outflows, the CC excludes an operational cash balance in its ROCE analysis. The CC has argued that the net working capital balance represents the average level of capital that is required by a business and that additional liquidity requirements could be met by using an overdraft facility.

5.142 HCA disagrees. An overdraft facility is not a direct alternative to a cash balance for a number of reasons. The holding of cash, rather than overdraft availability, is an important component in demonstrating financial robustness that supports the business in negotiating pension fund payments, property lease terms and reducing long term funding costs. Also the financing costs of an overdraft will be significantly higher than any interest earned on short term cash balances. [✂].

5.143 [✂].

5.144 [✂] over the five years, as illustrated in **Figure** A5.8 below:

[✂]

Figure A5.8 Volatility of HCA Debtors balances

5.145 The availability of cash is an important factor in negotiations between private healthcare providers and PMIs. As the CC outlined in relation to bargaining power and the 2011 Bupa delisting of BMI hospitals,[297] Bupa was able to exercise its buyer power more forcefully given that BMI had insufficient cash to fund its costs. BMI has highlighted that its difficult financial position, which Bupa was able to exploit to delist BMI hospitals during the contract

[297] CC, PFs, A6(11), para. 94.

negotiations, stemmed from a loss of cash flow.[298] This highlights the need for HCA and other PH providers to hold working cash balances.

5.146 Based on the evidence set out above it remains HCA's strong view that a working cash balance is required for the operation of its business, and HCA would suggest that, as an absolute minimum, a working cash requirement of [✂] in its mean capital employed.

[298] CC, PFs, A6(11), para. 255.

WEIGHTED AVERAGE COST OF CAPITAL (WACC)

Key Points

- The CC's estimated range for the cost of capital of a UK private healthcare provider is flawed, materially understating the true cost of capital.
- The CC's analysis includes:
  - An inappropriately low inflation assumption;
  - An ERP range that fails to take account of recent evidence on the market return; and
  - A range of comparators that are inappropriate, for a variety of reasons, resulting in an implausibly low asset beta.
- Correcting for the CC's errors, and, using the CC's methodology for estimating the WACC, we believe a reasonable range for the pre-tax nominal WACC is 12% to 14%.
- If we also take into account an adjustment to the asset beta to allow for higher levels of utility-type government revenues in the US, we believe a range of 13% to 16% is appropriate.
- Similarly, assuming an adjustment to the asset beta to reflect the results of the Fama-French model, HCA estimates the pre-tax nominal WACC to be in a range between 15% and 18%.
- We believe there are merits to each of these estimator ranges, and therefore we propose a reasonable overall range for the WACC of 12% to 18%.

Introduction

5.147 Having reviewed the CC's latest WACC analysis as presented in the PFs, HCA has a number of fundamental concerns with the CC's analysis and approach. The CC's flawed methodology has resulted in it significantly underestimating the WACC for a UK private healthcare provider and for HCA in particular.

5.148 HCA's contention is that the UK private healthcare market has a fundamentally higher systematic risk than many overseas markets (particularly the US market), especially as the NHS provides a "safety net" for consumers, allowing healthcare to be a discretionary purchase. As discussed below, HCA believes that the CC reaches a number of implausible conclusions, especially with regard to the asset beta and nominal risk-free rate. HCA is surprised that the CC implies, for instance, that a UK private healthcare provider would be perceived by investors to be less risky than a UK utility provider, and that a US private healthcare provider would have a lower cost of capital in the UK than in its domestic market.

5.149 The CC has made an error in the treatment of inflation in this case. This means that the cost of capital is being estimated in a manner that is not consistent with the precedents set in the Gatwick, Heathrow and Stansted Pricing Reviews, and the Bristol Water Appeal, despite the fact that these cases were all within the timeframe of the Healthcare market investigation. The error appears to come about because the CC uses an estimate of the inflation rate in its nominal risk-free rate that is significantly below the actual inflation rate. This is clearly an error as the actual RPI inflation rate will have been used to set coupon payments on index-linked gilts (ILG), and the actual inflation rate will have affected the cash flows contained in the financial statements. Further, the CC has failed to recognise that a real ERP of 4% to 5% is not the same as a nominal ERP of 4% to 5%.

5.150 We believe the CC's ERP range of 4% to 5% is not appropriate. We continue to believe that the relevant metric for estimation is the expected return on equities [E(Rm)], which is the combination of the real risk-free rate and the ERP. We believe a realistic range for the E(Rm) to be 5.5% to 7.25%, which, combined with a real risk-free rate of 1% to 2%, gives a range

for the ERP of 4.5% to 5.25%. We believe such a range is reasonable based on the Dimson, Marsh and Staunton (DMS, 2013) arithmetic average market returns, as well as recent regulatory precedent, notably from Ofgem.

5.151 When proposing such far-reaching remedies for an alleged AEC, the onus must be on the CC to show that excessive profits have been persistently made beyond reasonable doubt. HCA's case is that even using the CC's own data, and the CC's own precedents in Bristol Water and Stansted Airport, the CC has under-estimated the WACC materially, at both the upper and lower ends of its range.

5.152 HCA notes that the CC has missed other critical aspects in estimating the cost of equity. In making use of international comparators, the CC implicitly assumes that economies and healthcare markets are comparable, and that capital markets are integrated. In such circumstances, a global Capital Asset Pricing Model (CAPM) could be expected to hold, subject to the usual CAPM assumptions. Furthermore, country risk can become an issue in international comparison, and, to the extent that markets are integrated and comparisons are appropriate, the CC should be concerned with the likely cost of equity for comparator firms, not simply the beta.

5.153 The CC has also ignored the international evidence on the CAPM. As HCA showed in earlier submissions, allowing for the Fama-French Three-Factor model on HCA's preferred US proxies (which HCA has shown to be superior to the CC's eclectic selection of proxies), the cost of capital can be estimated to be a further 3–4ppt above a CAPM cost of capital.

5.154 Taking the arguments above into account, HCA estimates a standard CAPM-based pre-tax nominal WACC to be in a range of 11.7% to 14.0%. Taking into account an adjustment to the asset beta to allow for higher levels of utility-type government revenues in the US, we believe a range of 13.5% to 16.1% is appropriate. Similarly, assuming an adjustment to the asset beta to reflect the results of the Fama-French model, HCA estimates the pre-tax nominal WACC to be in a range between 14.9% and 17.8%.

5.155 The overall range of reasonable estimates for the pre-tax nominal WACC is therefore 11.7% to 17.8%. This is set out in **Table** A5.6 below:

Table A5.6 HCA WACC estimates

	HCA's estimates			CC's estimates
	Standard CAPM	**CAPM adj. for Govt revenues**	**Fama-French**	
Cost of Equity (Ke)				
Real Risk-free Rate (r_f)	1.0% – 2.0%	1.0% – 2.0%	1.0% – 2.0%	1.0% – 2.0%
Assumed inflation rate (infl)	3.46%	3.46%	3.46%	2%
Nominal Risk-free Rate (a) = [(1+rf)*(1+infl)] - 1	4.5% – 5.5%	4.5% – 5.5%	4.5% – 5.5%	3.0% – 4.0%
ERP (b)	4.5% – 5.25%	4.5% – 5.25%	4.5% – 5.25%	4.0% – 5.0%
Equity Beta (c)	1.53	2.09	2.54	0.86 – 1.03
De-gearing rate	58%	58%	58%	n/a
Asset beta (d)[299]	0.89	1.22	n/a	0.50 – 0.60
Post-tax real cost of equity (e) = r_f + (b x c)	**7.9% – 10.0%**	**10.4% – 13.0%**	**12.4% – 15.3%**	**4.4% – 7.2%**
Post-tax nominal cost of equity = [(1+e)*(1+infl)]-1	**11.6% – 13.8%**	**14.6% – 17.4%**	**16.3% – 19.3%**	**6.4% – 9.2%**
Cost of Debt (Kd)				
Risk-free Rate (f)	4.5% – 5.5%	4.5% – 5.5%	4.5% – 5.5%	3.0% – 4.0%
Corporate Debt Premium (g)	2.5% – 3.0%	2.5% – 3.0%	2.5% – 3.0%	2.5% – 3.0%
Corporate Tax Rate (h)	28.4%	28.4%	28.4%	28.0%
Re-gearing rate= D/(D+E) (i)	50%	50%	50%	50%
Post-tax Cost of Debt = (f + g) x (1 – h)	**5.0% – 6.1%**	**5.0% – 6.1%**	**5.0% – 6.1%**	**4.0% – 5.0%**
Post-tax WACC = (E x Ke) + (i x Kd) (j)	**8.3% – 10.0%**	**9.7% – 11.5%**	**10.7% – 12.7%**	**5.2% – 7.1%**
Pre-tax WACC = j / (1-h)	**11.7% – 14.0%**	**13.5% – 16.1%**	**14.9% – 17.8%**	**7.2% – 9.9%**

Sources: CC, HCA's own analysis

[299] The asset beta is derived from the average equity beta across the US comparator range, the US corporate tax rate (we assume 40% for the period in question), and the average gearing level for those comparators.

Background

5.156 The CC presented its initial estimate of the cost of capital for a generic UK private healthcare provider in its Profitability Working Paper, published on 1 March 2013, to which HCA responded on 3 April 2013. In the PFs dated 2 September 2013, the CC presented its revised estimate, which made a number of changes to the earlier analysis, including the following:

- The range used for the nominal risk-free rate is significantly lower (reduced from 3.5%–4.5% to 3.0%–4.0%);
- The lower end of the range for the equity risk premium is slightly higher (increased from 3.5% to 4.0%);
- The higher end of the range for the pre-tax cost of debt is slightly higher (increased from 6.5% to 7.0%); and
- The sample of comparable providers used for beta estimates has been revised.

5.157 This results in a slight change in the overall WACC estimates, from a range of 7.3% to 10.0% to a range of 7.2% to 9.9%.

5.158 HCA still has a number of key concerns with the CC's analysis, in particular in relation to the following elements of the WACC estimate:

- The nominal risk-free rate estimate is excessively low, and the methodology used by the CC is flawed and inconsistent with the Bristol Water and Stansted precedents;
- The beta estimates suffer from a number of weaknesses and are implausibly low;
- The time period used by the CC for its analysis is inconsistent and not appropriate for the purpose of this exercise;
- We believe the estimate for the expected return on the market portfolio [the E(Rm)] is too low, given the weight of evidence; and
- The treatment of inflation in calculating the WACC is incorrect.

5.159 Taking into account a higher estimate of the nominal risk-free rate and a higher asset beta estimate (based on a more appropriate comparator group), HCA estimates the pre-tax nominal WACC to be in a range between 12% and 14%.

5.160 Taking into account an adjustment to the asset beta to adjust for the lower volatility of Government revenues of US comparable providers, HCA estimates the pre-tax nominal WACC to be in a range between 13% and 16%.

5.161 Similarly, taking into account an adjustment to the asset beta to reflect the results of the Fama-French model, HCA estimates the pre-tax nominal WACC to be in a range between 14.9% and 17.88%.

Risk-free rate

5.162 The risk-free rate is the rate of return expected on a risk-free asset – that is, an asset that is free of default risk. The yield to maturity on government bonds is often used as an approximation of the risk-free rate. In Appendix 6(14) of the PFs (Appendix 6(14)), the CC reaches the following conclusions:

"*The nominal yield on gilts has ranged between 2 and 5 per cent, with an average of 3.8 per cent for ten-year gilts. On this basis, we have used a range of between 3.0 and 4.0 per cent as the nominal RFR".*[300]

"*This graph [of yields on UK index-linked gilts] shows the same downward trend as for nominal yields, with all maturities providing a negative real yield by the beginning of 2012. The real yields on 10-year gilts varied from -0.8 per cent to 2.8 per cent over the period and averaged 0.91 per cent. On this basis, we have used a range of 1.0 to 2.0 per cent for the real RFR".*[301]

5.163 HCA believes that the risk-free rate used by the CC in its analysis is excessively low.

5.164 HCA's contention is that there is an inconsistency between the CC's treatment in the Bristol Water case, and the treatment here. The Bristol Water case is regarded as a landmark case in which the CC estimated Bristol Water's cost of capital, which the CC explicitly refers to in Appendix 6(14).[302] In Bristol Water, the CC used a real risk-free rate of 2% alongside an inflation rate of 2.5%, resulting in a nominal risk-free rate of 4.5%.[303] In order to arrive at these estimates, the CC first estimated the real risk-free rate, based on index-linked gilt yields. It then estimated the inflation rate over the relevant period, and combined the two together.

5.165 However, in the current case, the CC has estimated the real risk-free rate to be 1% to 2%, with an associated inflation rate of 2%, giving a nominal risk-free rate range of 3% to 4%, with a mid-point of 3.5%. HCA believes that a consistent approach would require the CC to use the index-linked gilt yield for the real risk-free rate, alongside an estimate of the actual inflation during the period in question. The Retail Price Index (RPI) is the relevant inflation rate for comparing index-linked and nominal yields. Over the relevant time period, the average RPI was 3.46%,[304] which we believe should be combined with the 1% to 2% range for the real risk-free rate.

5.166 This gives an estimate of 4.5% to 5.5% for the nominal risk-free rate, with a mid-point of 5%, rather than the 3.5% mid-point assumption used by the CC.[305]

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[300] CC, PFs, A6(14), para. 13.
[301] CC, PFs, A6(14), para. 15.
[302] See for instance CC, PFs, A6(14), para 7.
[303] See page N54 of http://www.competition-commission.org.uk/assets/competitioncommission/docs/pdf/non-inquiry/rep_pub/reports/2010/fulltext/558_appendices.pdf
[304] Source: Office for National Statistics.
[305] HCA notes that the CC's approach would be consistent with a profitability analysis based on a real terms version of ROCE. Conceptually, the CC could have restated accounting numbers using constant prices, and used a real estimate of the cost of capital. Alternatively, it could have used a consistently estimated WACC, i.e. one that embeds the *actual* inflation rate. Unfortunately, the CC's analysis is internally inconsistent as it appraises cash flows and profits which have been subject to the actual inflation rate in the economy over the estimation period, and then appraised those using an under-stated target rate of inflation. This is clearly incorrect.

5.167 HCA notes that the CC has never used the current yield on gilts and has always used some form of adjustment. In Appendix 6(14), the CC refers to the 2003 Smithers Report. Both the 2003 Smithers Report and the 2006 Smithers & Co report argue that the lack of evidence for a stable mean lends some weight to the case for using current estimates rather than historical averages. However, it then draws attention to the need to take account of distortions to bond markets, and so anchor its risk-free rate estimates using a "Taylor Rule". A common feature in regulatory cases throughout the past five years has been an adjustment to market gilt yields. This is actually a continuation of a long-standing practice dating back to the 1990s where index-linked gilt yields (usually the preferred base for estimation) were argued to be "distorted" by pension fund liquidity requirements. Currently the argument is that a mix of such pension fund activity coupled with the Bank of England's "Quantitative Easing" programme is such that market yields are not a reliable indicator of the true risk-free rate.

5.168 Therefore, HCA notes the CC would be departing from precedents if it did not make such an adjustment in the current case. Given that the CC's profitability analysis for the private healthcare market covers the January 2007 to June 2012 period the CC should maintain consistency with the Bristol Water appeal and the Stansted judgement. The CC used a 2% real risk-free rate in the Stansted case, and a 1% to 2% real risk-free rate in the Bristol Water precedent.

5.169 When setting out its approach to estimating the nominal risk-free rate, the CC states:

"*In previous market investigations, we have taken the view that long-dated yields, whilst in principle the most suitable basis for estimating the RFR, are often affected by market distortions (associated, for example, with pension fund dynamics) which make them an inappropriate proxy for the RFR. Consequently, we have tended to use yields on shorter- and medium-term gilts as a proxy for the RFR. However, the effects of the financial crisis and the response by external agents to the market, such as the Bank of England, have caused volatility in gilt yields, with shorter-dated gilts particularly affected. We believe that this volatility, together with the emergence of a significant gap between the yields on gilts of varying maturities over this period, may make short-term gilt yields a less reliable indicator of the RFR. Consequently, we have placed greater weight on the yields on 10-year gilts in reaching our view on an appropriate RFR. This results in a (slightly) higher estimate of the RFR than would be the case if we had focused on five-year gilt maturities*".[306]

5.170 In addition to the lack of consistency between the way in which the risk-free rate has been estimated in this case and others, the CC's methodology to estimate the nominal risk-free rate is unclear, and the CC seems inconsistent in its explanations:

- The CC states that it has placed a greater weight on 10-year maturity gilts, but it does not explain how / to what extent. Similarly, the CC states on one hand that market distortions make long-dated yields "*an inappropriate proxy for the RFR*", and on the other hand that short-term yields may be "*a less reliable indicator of the RFR*". However, the 3.8% average mentioned by the CC seems to be an arithmetic mean of the monthly averages across the four types of gilts between January 2007 and June 2012.

- Besides, the CC does not stipulate clearly which yields it has used in Table 2 (Average annual yields, UK gilts, 2007 to 2012), as they are simply referenced as

[306] CC, PFs, para. 12.

"*Bank of England Monthly average yield on government securities*". Indeed, the figures are close to but do not match nominal zero coupon yields available on the Bank of England's website. It is also not clear where the 15-year term gilts data are sourced from, as HCA has not been able to find these figures on the Bank of England's website, and therefore has not been able to check the veracity of these data.

- The CC states that the average yield is 3.8%, but uses a range from 3% to 4% for no obvious reason, which biases the results. Given that the mid-point of the range is chosen for the CC's calculations (i.e. 3.5%), this results in a material understatement.

- The inclusion of January to June 2012 figures in the CC's calculations of the risk-free rate has a material negative impact on the average yield (of about 0.3 ppt). This is not appropriate, because:

    - In the first half of 2012 UK government yields were particularly distorted by the sovereign debt crisis; and

    - Out of the seven providers under consideration for the industry-level financial analysis, it seems that only one of them (Ramsay) has a June financial year end (i.e. the profitability analysis of only one provider is extended to June 2012). Five providers have January 2007 to December 2011 as the relevant time period, and the analysis for BMI is carried over the October 2006 to September 2011 time period.[307]

5.171 Therefore, it is surprising that the CC states that it has "*chosen to use the 51/2-year period ending 30 June 2012 to match the period over which [it has] considered the profitability of the private hospital operators as a whole*".[308] HCA believes that if the CC wants to keep a five-year single industry approach, the relevant time period for the cost of capital analysis should be that of the largest number of providers, which is January 2007 to December 2011. If the CC wants to take into consideration the complete time range of the profitability analysis, then it should consider the October 2006 to June 2012 period, to reflect the analysis for BMI starting in October 2006 and the Ramsay analysis ending in June 2012.

5.172 In conclusion, HCA believes that, beyond a number of technical flaws and uncertainties in the CC's methodology to estimate the nominal risk-free rate, its overall approach is not appropriate for the purpose of this exercise. As discussed in paragraphs 5.168 to 5.172 above, the CC, consistent with recent precedents, should have combined a real risk-free rate estimate with a suitable inflation rate, which would yield a nominal risk-free rate range of 4.5% to 5.5%.

5.173 In the Bristol Water and Stansted cases, the CC emphasised the need for consistency between the risk-free rate, expected return on the market and equity risk premium estimates used in calculating the cost of equity. HCA has maintained that principle in its submission. However, it appears that the CC has not done so in the current case, so if, as discussed in the next section, the CC wishes to use a conservative estimate of the equity risk premium, the corollary is that it must employ a consistent estimate of the risk-free rate.

[307] See CC, PFs, Table A1 in A6(13), Annex A.
[308] See CC, PFs, A6(14), para. 57.

Equity risk premium, ERP and the expected market return, E(Rm)

5.174 The ERP is the extra return required by equity investors in order to compensate them for the higher risk associated with investing in stocks other than risk-free assets. In Appendix 6(14), the CC concludes that:

"*The geometric and arithmetic averages of historical market returns over the last 110 years suggest a range for the market return of between 5 and 7 per cent; Fama and French's evidence suggests a long-run market return of 5.5 per cent with a short run (since 1950) of 4.5 per cent, although with less extensive statistical data. Forward-looking approaches suggest a market return of 5.5 to 6.5 per cent. Based on this evidence, we have used a range of 5 to 7 per cent average return on equities which, together with a real RFR of between 1.0 and 2.0 per cent, implies an ERP of between 4.0 and 5.0 per cent*".[309]

5.175 HCA believes that the CC's estimates of the market return and the equity risk premium are unreasonably conservative, for two main reasons:

- First, the estimate of the risk premium is not consistent with the estimate of the risk-free rate;
- Secondly, the geometric mean of historical returns used by the CC is not appropriate for the purpose of this analysis; and
- Thirdly, the CC's estimates of the ERP in the current case are in nominal terms. Properly taken into account, inflation should increase this ERP estimate.

5.176 We will set out in more detail our reasoning below, but before we do that, it is worth considering first how these terms are used in the CAPM.

5.177 The expected return on an asset (R_i) is defined as follows:

$$E(R_i) = R_f + \beta_i * (E(Rm) - R_f)$$

Where R_f is the risk-free rate, β_i is the beta factor of asset in question, and E(Rm) is the return on the market.

5.178 Whilst the term $E(Rm) - R_f$ is often abbreviated to be the equity risk premium, or ERP, writing the equation out in full serves as a useful reminder that the precise definition of ERP is the expected return on the market minus the risk-free rate. As Jenkinson[310] (1993) points out, the important point is that there is only *one* RF term on the right hand side of the CAPM, not two.

The risk-free rate and the market return should be consistent

5.179 When estimating the market components, R_f and $E(Rm)$, it is important that, when assessing long run averages of Rm and R_f, the data are treated consistently, as The Smithers & Co Report, 2003, (The Smithers Report) makes clear. And if long run averages are to be used, then it is important to select a long enough period so that expectations errors cancel out.

[161] CC, PFs, A6(14)10, para. 26.
[310] Jenkinson, T., 1993a, The Equity Risk Premium and the Cost of Capital Debate in the UK Regulated Utilities, working paper, Keble College, Oxford.

5.180 If, as many economists believe, long run historical returns are the best guide to expected returns, the expected market return could, in principle, be estimated by adding a historical estimate of the ERP to the estimate of R_f. But this is only true if the risk-free rate is stable over time, implying that the market risk premium is also stable. Alternatively, Rm expectations can be estimated directly from the historical estimate of the Rm series itself. Doing so implies that the return on equities is stable, and places no constraint on the stability of either R_f or ERP.

5.181 This point is explored in some detail in The Smithers Report.[311] The authors of this report see a considerable advantage to regulators in focusing on the relative stability of the market return.[312] This is useful, because the expected return on an asset can be rewritten as:

$$E(R_i) = R_f *(1 - \beta_i) + \beta_i *(E(Rm)$$

5.182 This means that, provided the equity beta factor is more than 0.5 (which is the case for most companies in general, and HCA believes to be the case in the UK private healthcare market), then greater weight is placed on the second component of the expected return, the expected return on the market, E(Rm), for which estimates are more certain.

5.183 The appropriate proxy for the risk-free rate is the subject of some debate. Both the Smithers Report and the 2006 Smithers & Co report argue that the lack of evidence for a stable mean lends some weight to the case for using current estimates rather than historical averages. However, they then draw attention to the need to take account of distortions to bond markets, and so anchor their R_f estimates using a "Taylor Rule".[313] This leads them to recommend a 2.5% real R_f.

5.184 However, the conclusion of the Smithers Report[314] with regard to regulatory estimation using the CAPM is worth stressing:

"*we regard the standard approach to building up the cost of equity, from estimates of the safe rate and the equity premium, as problematic. We would recommend, instead, that*

[311] The Smithers Report is unequivocal on this point, and by examining the international cross-section of realised returns from Dimson, Marsh and Staunton (2001) shows that the return on equities is more stable than the MRP. According to the Smithers' Report, the real risk-free rate does *not* have a stable mean, based on both the international evidence on the cross-section of real risk-free rates, and on a very long run analysis that uses Siegel's (1998) US data set. As the real R_f is not stable, the authors conclude that the ERP is less statistically reliable. As The Smithers Report explains, the solution to this problem is straightforward. As the return on equities series does appear to have a stable mean, one can simply use that series directly to obtain estimates of *E(RM)* in the CAPM. So as the Smithers Report makes clear, the appropriate and consistent way to derive a market risk premium is to calculate it as the difference between the *E(RM)* and R_f estimates.

[312] *"The relatively greater importance of the market return is fortunate for the regulators, since we argue that there is considerably more uncertainty about the true historic risk-free rate, and hence the equity premium, than there is about the market return itself. The historic size of the equity premium is still the subject of considerable puzzlement and controversy amongst academics; but this is largely due to the historic behaviour of the risk-free rate (proxied by the short-term interest rate). In contrast, we summarise a range of evidence that the equity return has, over reasonably long samples, been fairly stable both over time, and across different markets".*

[313] To quote from a Federal Reserve working paper by Orphanides (2007)"Taylor rules are simple monetary policy rules that prescribe how a central bank should adjust its interest rate policy instrument in a systematic manner in response to developments in inflation and macroeconomic activity". See: http://www.federalreserve.gov/pubs/feds/2007/200718/200718pap.pdf

[314] Page 48.

estimates should be derived from estimates of the aggregate equity return (the cost of equity for the average firm), and the safe rate".

5.185 This argument will be familiar to the CC, as it has made precisely this argument in the Stansted case:[315]

"*By presenting our conclusions in this review in the form of a range for Rm, we hope that we were making our interpretation of the evidence in Table 7 easier to follow and understand. We also believed, in the context of this review, that the Rm term in CAPM is unlikely to have been affected significantly by short-term changes in the risk-free rate*".

5.186 That observation is particularly relevant to the current case. Further, In Bristol Water, Appendix N, when reviewing this case the CC again emphasises the importance of the underlying E(Rm) estimate, rather than the ERP, and stresses the importance of not underestimating the cost of capital (para 78, pN20):

"*In the Stansted regulatory report, the CC derived an ERP of 3 to 5 per cent by subtracting its RFR of 2 per cent from a market return of 5 to 7 per cent. The CC effectively took a figure from near the top of this range because it considered that the consequences of setting too low a figure for the cost of capital (lack of investment) were worse than the consequences of setting too high a figure (higher charges). The implied figure for the market return would be 6.6 per cent*".

5.187 In Bristol Water, the CC takes this argument a good deal further, and in Appendix N, Table 4, reports a comprehensive analysis of varying approaches to estimating historical returns, including results from simple averaging, averaging five year returns, and applying the Blume (1979) unbiased estimator, and the Jacquier et al (JKM) (2005) small sample version of the estimator. Given the profitability analysis in the private healthcare market investigation covers a five year period, we also consider the results from the five year holding period, as well as the usual convention of looking at single year returns.

5.188 When looking at historical returns it is necessary to consider how any average data points were calculated.

Geometric mean of historical returns

5.189 The CC has rejected HCA's argument that the arithmetic mean of historical returns was the most appropriate method to estimate the equity market premium for the purpose of this exercise. However, the CC appears to be ignoring the precedent from Bristol Water.

5.190 This case is particularly relevant in this context as the CC sets out in some detail alternative approaches to estimating the market return in the Bristol Water case. In this precedent it discussed the issue of geometric and arithmetic averages (also discussed in Stansted), including an explicit calculation of simple return averages for various holding periods, together with the Blume (1974) and Jacquier, Kane and Marcus (2005) estimators for these holding periods. This analysis set out the results using Dimson, Marsh and Staunton (DMS) and Barclays Capital data. The CC concluded that "*the interpretation of the evidence on market returns remains subject to considerable uncertainty*".

[315] Para. 79 in Appendix L, page 19.

5.191 However, HCA would also note that the CC quotes from The Smithers Report. In the 2006 Smithers Report for Ofgem, the authors argued in favour of an uplift of 2% in obtaining the arithmetic risk premium from the geometric risk premium on the grounds that such an uplift is "conservative".

5.192 Finally, academically, the classic reference here is Cooper (1996), who shows that in the presence of estimation error and serial dependence in returns, the corrected discount rate is closer to the arithmetic mean of the historical series than the geometric mean. For these reasons, we believe that the arithmetic mean is a more appropriate estimate than the geometric mean.

The evidence points to an upper bound market return of 7.25%

5.193 As the DMS data is the most comprehensive analysis available, we place particular weight on those results and note that whether five year or single year returns are used, or whether Blume or JKM estimators are employed, the historical data suggests that the long run return on the UK Market return has been 7% or 7.1% in real terms. HCA submits that 7% to 7.1% forms a reasonable expectation of the long run return on the UK market, and notes that this is below the most recent estimate in UK regulatory cases, where recent Ofgem estimates of the cost of equity for RIO, National Gas and National Grid all use an estimate of 7.25%.[316]

The evidence points to a lower bound market return of 5.5%

5.194 In Bristol Water, the CC discusses alternatives to the historical return, including the DMS decomposition analysis of realised returns. The central idea behind this decomposition is to estimate those elements which are repeatable in the future (essentially, dividend payments and dividend growth) and filter out those that are not (expansion in valuation multiples and exchange rate effects). DMS then use this analysis to infer a likely equity risk premium for the future. This estimate is 4.5% to 5% on an arithmetic average basis.

5.195 As these figures are derived from an analysis relative to the historical return on US Treasury Bills of 1%[317], the implied forward arithmetic average return on the market is in the range 5.5% to 6%. In HCA's view, this 5.5% figure represents a lower bound on the expected market return (or to put it another way, if the lower bound of the real risk-free rate is 1%, then the lower bound of the ERP is 4.5%).

5.196 Our analysis follows the spirit of the CC's previous reports in working with an upper and lower bound for the real E(Rm) and R_f components, but with an upper case E(Rm) of 7.25% and a lower case E(Rm) of 5.5%. In association with the upper case real R_f estimate of 2%, and a lower case estimated real R_f estimate of 1%, these imply a real ERP in the range 4.5% to 5.25%, which HCA regards as reasonable in the light of the evidence presented.

5.197 Finally, HCA notes that the correct way to estimate the WACC in the case of a market investigation is to use the *actual* inflation rate over the period, as it is this actual inflation rate which will have affected the financial results which are being appraised. The CC appears to have used an *expectation* of the inflation rate in its analysis. Whilst expected inflation is relevant to a regulatory price review, it is inconsistent to apply an expected inflation rate in estimating a nominal WACC that will be used to assess an ROCE based upon financial results that will have been subject to realised inflation.

[316] The reports combine a real risk-free rate estimate of 2% with an ERP estimate of 5.25% yielding an implied market return of 7.25%.
[317] Arithmetic average, Table 71, p.175, DMS 2012.

5.198 Based on ONS data, RPI inflation (which is the relevant inflation figure, as it is used to calculate the coupons paid on index-linked gilts) averaged 3.46% during the five year period. The appropriate calculation of WACC therefore involves estimating the component elements of the cost of capital in real terms, and then calculating the nominal WACC from the formula:

Nominal WACC = ([1 + real WACC] x [1 + actual inflation]) – 1.

Beta estimates: comparable providers

5.199 It is general practice to use beta estimates derived from observed share price and general market movements. As long as the data is available it is possible to obtain historical estimates of systematic risk based on these observed movements.

5.200 However, there are no publicly traded UK private healthcare providers, and therefore direct observation of share price movements (and therefore systematic risk) is not possible. Given this, the use of comparator data is required to estimate a benchmark level of systematic risk of a UK healthcare provider.

5.201 The CC has considered some of the arguments put forward by HCA in its response to the Profitability Working paper. In particular, the CC concludes that:

"*We reviewed the original list of comparable companies and removed Generale de Sante, Bangkok Dusit and Mediclinic International on the basis that these companies were relatively thinly traded and hence might produce biased beta estimates. However, we do not agree with HCA's view that the South African and Indian markets are too small or illiquid to provide reliable beta estimates*".[318]

5.202 HCA notes that the CC has accepted the arguments made in HCA's response to the Profitability Working Paper regarding the inappropriateness of Generale de Sante, Bangkok Dusit and Mediclinic International in the sample of comparable providers.

5.203 However, the CC has rejected HCA's claim that Apollo Hospitals Enterprise, Fortis Healthcare and Netcare should be excluded from the sample, on the basis that the Mumbai Stock Exchange and the Johannesburg Stock Exchange are "*sufficiently large and liquid to provide reasonably reliable beta estimates*".[319] HCA disagrees with the CC's assessment, based on the evidence provided below.

Inappropriateness of the South African and Indian markets

5.204 First, HCA disagrees that the turnover of the Johannesburg Stock Exchange and the Mumbai Stock Exchange (respectively 60% and 26% of their total market capitalisations each year) constitutes evidence that these markets are sufficiently liquid. As submitted in HCA's response to the Profitability Working Paper,[320] the turnover rates (as a percentage of market capitalisation) of the FTSE 100 and S&P 500 indices are between two and four times higher than those of the FTSE/JSE Africa All Share (South Africa) and S&P BSE India Sensex (India) indices.

5.205 Moreover, HCA notes that India and South Africa are both emerging markets (the size of which is irrelevant for the purpose of this exercise), and stresses that to employ firms from

[318] CC, PFs, para. 35.
[319] CC, PFs, para. 35.
[320] See Appendix 2, Table 3.

such markets as proxies the CAPM needs to hold and the efficient-market hypothesis needs to be satisfied. HCA considers that this is not the case for these two countries.

5.206 For efficient and frictionless markets, the following elements are needed:

- Good standards of governance;
- Tightly regulated markets; and
- Rules to prevent abuse, for example restrictions on insider trading.

5.207 HCA does not believe that the Indian and South African markets satisfy these criteria. For instance, both countries score particularly poorly on the Corruption Perception Index published by Transparency International, ranking respectively 94th and 69th in 2012[321]. Moreover, examples such as the six-year long tax dispute between Vodafone Plc and the Indian government (following the acquisition by the former of a majority stake in the Indian operations of Hutchison Whampoa) support HCA's claim that countries such as India and South Africa are not consistent with the conditions one would normally associate with efficient and frictionless markets.

5.208 In addition, the fact that none of these comparators (i.e. Apollo Hospitals Enterprise, Fortis Healthcare, Netcare and Ramsay) are rated by any of the three main credit rating agencies (i.e. Standard & Poor's, Moody's and Fitch), as noted by the CC in Table 8 of Appendix 6(14), suggests that these companies may not be regarded as part of the investable universe by large international investors, and casts further doubt as to their suitability for the purpose of this analysis.

5.209 Furthermore, HCA notes that the beta estimates for Netcare vary significantly with the choice of the relevant South African stock index (FTSE JSE or MSCI SA), which casts further doubt as to the appropriateness of this company in the list of comparable providers. If Netcare's weekly beta is estimated using the FTSE JSE, the estimated beta is 0.574. However, this becomes 0.675 if the MSCI South African index is employed. These estimates are 0.534 and 0.625 respectively when estimated on a monthly basis. However, these betas do not fully reflect the systematic risk of a South African healthcare provider because a local CAPM beta does not properly capture any country risk (Damodaran, 2013). Thus a CAPM that employs only a local beta and an international market risk premium will give a misleading low impression of the cost of equity because it excludes the country risk premium. This country risk premium would internalise some of the risk associated with the problematic market features mentioned above.

5.210 A similar argument applies to the Indian proxies chosen. Damodaran's website estimates that this country risk premium would add a further 2.25% to the US ERP in the case of South African companies, and a further 3% to the US ERP in the case of Indian companies.[322]

5.211 Notwithstanding these adjustments, though, HCA emphasises the arguments above that it is inappropriate to use South African and Indian proxies because of the very different natures of both the economies and healthcare markets between these emerging market countries and the UK.

[321] See http://www.transparency.org/cpi2012/results
[322] See: http://people.stern.nyu.edu/adamodar/ and the data pages relating to country risk premia.

5.212 Consequently, HCA believes that for these reasons, Apollo Hospitals Enterprise, Fortis Healthcare and Netcare are not suitable for the purpose of this exercise.

Treatment of Bangkok Dusit and Mediclinc International

5.213 HCA is unclear whether the CC has included Bangkok Dusit and Mediclinic International in its sample of comparable providers. Whilst the CC states that it has removed these companies from the sample in paragraph 35, both Bangkok Dusit and Mediclinic International are included in both Table 8 (credit ratings) and Table 9 (gearing) of Appendix 6(14). For the reasons mentioned above and in its response to the Profitability Working Paper, HCA believes that these two companies are not appropriate comparable providers for the purpose of this analysis and should not be used by the CC, if indeed they have been.

Ramsay's beta is not a reliable indicator

5.214 In addition, HCA believes that Ramsay should not be included in this analysis, because the Australian market is largely dominated by resource companies. This means that betas for non-resource companies will be lower than expected elsewhere, and the Australian market in general will be more risky (this is further evidenced by the DMS data for Australia). This is supported by the fact that Ramsay has an unlevered beta (0.17 to 0.28) significantly lower than any of the other providers considered by the CC (average of 0.51 to 0.56 across the CC's full sample), with the exception of Netcare.[323]

5.215 A careful analysis of the results of the beta regression shows that for Ramsay, the intercept is highly significant. Clearly, in part this can reflect out-performance of the firm, but the intercept from weekly regressions is so large (0.35% per week over the five and a half year period from June 2007) that, coupled with a very low R-squared[324] (7.5%), this could mean that the CAPM simply fails to provide robust cost of capital estimates for this company. This suspicion that the CAPM is wholly inadequate is confirmed by monthly regressions, which show that the whole regression equation is insignificant (the p-value from the F-test being 0.2041), the beta is not significantly different from zero, and the intercept is a significant 1.49% per month. If one looks at these regression equations, as opposed to simply falling back on Bloomberg figures, it is clear that any CAPM estimates for Ramsay are statistically unreliable, and that it should be excluded from the analysis.[325]

5.216 HCA has also undertaken an analysis of rolling one year (i.e. 52-week cycle) betas from January 2007 to date (based on weekly data) which shows that Ramsay's beta is extremely unstable, ranging from -0.26 to 0.99. These estimates are presented in **Figure** A5.9 below.

[323] See CC, PFs, A6(14), Table 5.
[324] R-squared is the coefficient of determination of the beta regression; therefore, it is a measure of the "goodness of fit" of the beta regression (i.e. how well the real data points are approximated by the regression line).
[325] It is not clear to HCA how Bloomberg's beta estimates are made, or whether dividends are properly allowed for. HCA's estimates are all made using total return indices (from *Datastream*) which make proper allowance for dividend payments by firms and across the market. Further, all HCA's regression tests use robust estimates of standard errors using White/Huber/Sandwich estimators in *Stata*.

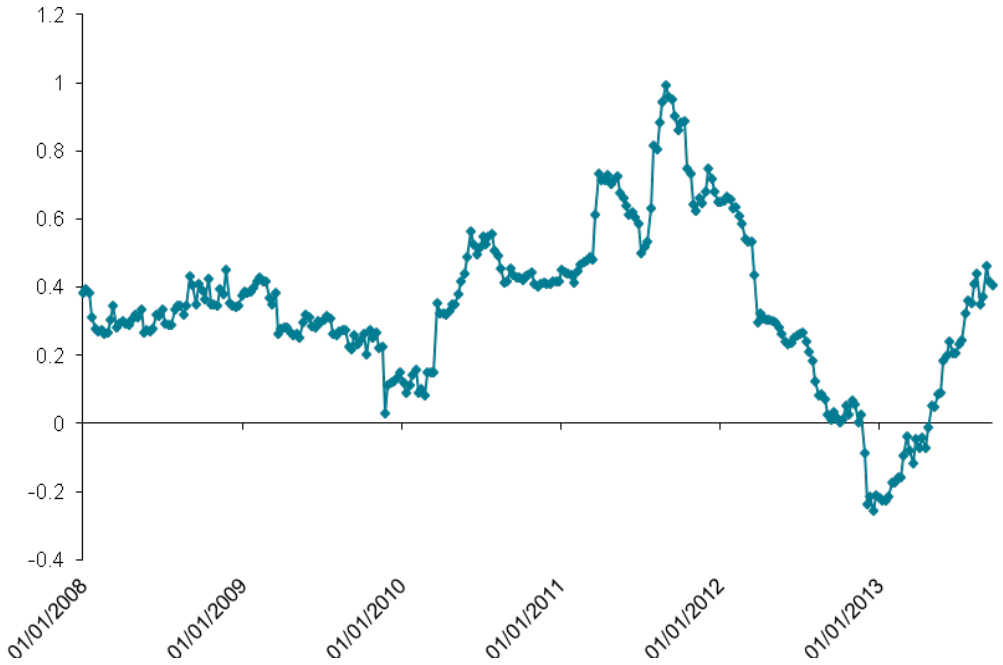

Figure A5.9 Rolling 52-week equity beta estimates of Ramsay[326]

5.217 In its response to the Profitability Working Paper, HCA argued that "*not only does Ramsay generate 80% of its revenue (and 86% of its operating margin) outside the UK, specifically in Australia and Indonesia, but its shares are also relatively thinly traded (only 1.1% of the company's market capitalisation is traded each week on average)*".[327] HCA notes that the CC did not respond to this argument. Rather, in Appendix 6(14) the CC simply states that it considers that, "the beta values of Netcare, Ramsay and HCA are relevant due to their exposure to the UK healthcare market".[328] It states this without assessing the level of this exposure, and the extent to which this exposure is reflected in the betas of the parent companies of these operators.

5.218 Finally, HCA notes that the asset beta estimate CC has chosen to rely upon is simply implausible in any event. It seems hard to argue that an Australian healthcare provider with a significant exposure to the Indonesian market somehow has a lower asset beta than a regulated water utility in the UK (Bristol Water), yet that is the CC's position. With proper analysis, it can readily be seen that this implausible beta estimate is an artefact of the statistically unreliable estimates the CC has made.

HCA Inc.

5.219 Regarding the inclusion of HCA Inc. (HCA UK's parent company) in the sample, the CC states that it does "*not have reason to believe that HCA's beta would have been significantly different for the first four years of the period than for the last 15 months or so*".

[326] Source: analysis based on DataStream.
[327] See HCA's response to the Profitability Working Paper, Appendix 2, para. A2.2.27.
[328] Para. 36.

5.220 As mentioned in HCA's response to the Profitability Working Paper, HCA Inc. was not publicly listed between July 2006 and March 2011.[329] HCA finds it surprising that on the one hand, the CC claims that the use of weekly data is more appropriate for beta estimates (which HCA strongly contends) based on the fact that the sheer number of data points is what matters the most, and yet on the other hand does not find any issue with including a company which was not listed for over four out of the five and a half years of the relevant time period.

5.221 In addition, the large difference between weekly- and monthly-based beta estimates for HCA Inc. suggests that this equity may present thin-trading problems. HCA has tested for this by including three lagged weekly market return terms. These terms (if significant) can then be used to form a Dimson (1979) estimator of the beta. In general, the betas of the lagged terms would be expected to be statistically insignificant. However, this is not the case for HCA. If this regression is run on the CC's apparently-preferred weekly data, the contemporaneous market return has a significant beta of 1.03, the first lagged market return term has an insignificant beta of 0.05, the second lagged term has a highly significant beta of 1.14, and the third lagged term has an insignificant beta of -0.04. Ignoring the two insignificant elements (which anyway virtually cancel), the Dimson (1979) estimator for the true weekly beta (i.e. the beta corrected for thin trading) is 1.03 + 1.14 = 2.17. Thus the CC's weekly estimate, based on a short run of data, seriously underestimates the true beta in not allowing for these effects.

5.222 In passing, HCA notes that there is weak evidence of thin trading in the estimates for Universal and Community, which appears to go some way to explaining the differences between weekly and monthly beta estimates.[330] However, the highly significant effect in HCA may be related to the firm being newly floated.

5.223 Finally, HCA notes that its estimate of HCA's monthly beta is higher than that presented by the CC. HCA estimates that the monthly beta is 1.624. However, one way of addressing the limited data period problem is to extend the window for monthly returns up to the end of August 2013. If the beta is stable and reliable, this should not change the estimate by much. In fact, doing so results in a beta estimate of 1.85. Again, it appears that the CC seriously underestimates HCA's likely beta in its analysis.

5.224 For the reasons stated above, HCA has excluded HCA Inc. from its group of comparable providers in its base case estimates. However, as discussed below in paragraph 5.235, HCA has carried out a sensitivity analysis with an expanded group of providers, which include HCA Inc.

Conclusion on the relevance of the CC's list of comparable providers

5.225 HCA believes that the arguments presented above constitute a strong case for the exclusion of Apollo Hospitals Enterprise, Fortis Healthcare, HCA, Netcare and Ramsay from the sample of comparable providers used by the CC to estimate the equity beta.

5.226 In addition, HCA notes that the asset betas for many of these proxies (e.g. 0.23 to 0.26 for Netcare; 0.17 to 0.28 for Ramsay) are simply implausible when compared to the range estimates for utility (0.30 to 0.45) and other companies presented in the Bristol Water

[329] See HCA's response to the Profitability Working Paper, Appendix 2, para. A2.2.20.
[330] HCA has not estimated thin trading adjusted betas as the p-value of the first lagged market return is 0.108 in both cases.

decision.[331] HCA believes that this alone should have prompted the CC to seek to explain these implausibly low values. In previous cases, the CC has taken care to set out the likely range of betas to see if estimates are plausible. HCA finds it surprising that the CC implies that UK private healthcare companies could have lower asset betas than a UK water company, a pure play utility with a regulator that has an explicit duty to finance function.

HCA's suggested approach

5.227 In the PFs, the CC has not included HealthSouth in its list of comparable companies, "*as the business focuses on the provision of long-term rehabilitation services rather than acute healthcare*".[332] HCA has followed the CC's approach, and excluded HealthSouth from the sample of comparable healthcare providers.

5.228 Consequently, HCA has included the following companies in its sample of comparators:

- Community Health Systems;
- Health Management Associates;
- LifePoint Hospitals;
- Tenet Healthcare; and
- Universal Health Services.

5.229 In addition, HCA has carried out a sensitivity analysis including HCA Inc. and Rhoen Klinikum[333] in the sample. As mentioned in HCA's response to the Profitability Working Paper, "Rhoen Klinikum is reasonably well traded, and sufficiently well-capitalised to present a reasonable beta comparator for the purposes of this analysis. However, the remainder of HCA's beta comparators are all US providers, listed on the same market and using the same index. Therefore, while HCA has included Rhoen Klinikum in the sensitivity analysis for the asset beta of a UK healthcare provider, HCA's base case uses just US providers".[334]

5.230 In its response to the Profitability Working Paper, HCA stated that it "believes that the most highly-developed, competitive and liquid market for healthcare providers is the US market. This is the market which provides the greatest scope and broadest range for comparator data for UK healthcare providers".[335]

5.231 HCA believes that, although the most appropriate approach, beta estimates based on US providers are likely to significantly underestimate the level of risk of a UK private healthcare provider, for two key reasons:

- First, HCA reiterates that "there are differences between the UK and the US in terms of the available alternatives to private healthcare on an individual consumer basis. In the UK, consumers always have the NHS to "fall back on" during tough economic times, whereas this is not always the case in the US. Therefore, HCA would expect

[331] Appendix N Figure 8.
[332] CC, PFs, A6(14), para. 36.
[333] As shown in Table 1, the R-squared of the beta regressions for Rhoen Klinikum is very low (i.e. 0.079 with monthly data). Therefore, HCA believes that Rhoen Klinikum should be excluded from the list of comparable providers.
[334] A2.2.28.
[335] A2.2.30.

the returns of UK private healthcare providers to be more cyclical in nature (i.e. during good times consumers purchase more private healthcare and in tough times they have the option to fall back on the NHS), and to present a higher level of systematic risk than those of US providers".[336]

- Secondly, HCA notes that government contracts tend to represent a significant share of the business of US private healthcare (for instance, they represented approximately 45% of HCA's US business in 2011). **Table** A5.7 below presents the proportion of total revenue which Medicare and Medicaid business represent for the comparable providers. As government contracts tend to present very low volatility, the beta factors for such companies are likely, all things being equal, to be lower than that of a provider relying solely on "purely" private business.[337]

Company	FY07	FY08	FY09	FY10	FY11	Arithmetic mean
Community Health Systems	39.3%	36.6%	36.9%	38.1%	36.5%	37.5%
Health Management Associates	41.0%	40.0%	41.0%	40.6%	40.0%	40.5%
Lifepoint Hospitals	41.7%	39.7%	39.2%	48.3%	48.7%	43.5%
Tenet Healthcare	34.6%	33.9%	33.1%	32.6%	32.2%	33.3%
Universal Health Services	39.0%	38.0%	38.0%	38.0%	37.0%	38.0%
HCA	n/a	n/a	n/a	n/a	44.5%	44.5%
Arithmetic mean						39.5%

Source: analysis based on 10-k filings

Table A5.7 Medicare and Medicaid business of comparable private healthcare providers, as a percentage of total revenue

5.232 The proportion of government-related revenues amongst the US providers can be contrasted with those of HCA UK, where government revenues constitute around [✂] of total revenues. Therefore, in addition to the standard CAPM, HCA has estimated the WACC using an asset beta adjusted to take into account the lower volatility of Government revenues. These estimates are presented in Table A5.8. In order to estimate a non-utility asset beta, we have assumed that stable government revenues are associated with a generic utility asset beta of 0.375, based on the utility asset beta range of 0.3 – 0.45 given by the CC in the Bristol Water

[336] A2.2.31.
[337] It should be noted that this situation is not comparable with NHS-funded patients in the UK private healthcare market, in that in the UK the NHS does not grant "block" contracts to private healthcare providers, but rather gives choice to individual patients.

case. Then we have assumed that this asset beta applies to the proportion of revenues associated with government contracts.

5.233 Such an approach is analogous to that used by Ofcom to disaggregate the asset beta of Openreach and the Rest of BT from the BT Group asset beta. Ofcom begins by estimating the BT Group asset beta based on direct observations, then estimates the Openreach asset beta using utility comparators, and then imputes the asset beta for the non-utility part of the business, based on the relative proportions of the business assumed to be utility-like and non-utility.[338]

UK versus US market

5.234 In the PFs, the CC has rejected HCA's argument regarding the lack of development of the private healthcare market in countries other than the US:

"*We recognize that the systematic risks faced by the private healthcare operators in Table 5 may not be entirely representative of those faced by a standalone UK operator due to differences in healthcare systems across countries. However, we consider that this issue is best addressed by considering a range of operators across a number of countries rather than by focusing exclusively on US-listed stocks, the beta values of which will be influenced by the specific characteristics of the US healthcare market. It is not clear that the factors influencing the betas of US private hospital operators are more pertinent to a stand-alone UK operator than the factors influencing the betas of Australian, German, South African or, indeed, Indian private hospital operators. In particular, we consider that the beta values of Netcare, Ramsay and HCA are relevant due to their exposure to the UK healthcare market*".[339]

5.235 Again, the CC's approach is inconsistent. On the one hand, when defending the use of weekly data the CC claims that robustness of the beta estimates is the key issue; yet on the other hand the CC disregards this approach when choosing its list of comparable companies, alongside the empirical evidence. Indeed, HCA notes that the R-squared of the beta estimates tend to be significantly higher for US providers than for companies from other countries.

5.236 Therefore, HCA reiterates that its approach using US comparators as a starting point is the most appropriate for this exercise, and that, for the reasons stated above, these US comparator beta estimates are likely to underestimate the level of systematic risk (and therefore the beta) of a UK private healthcare provider.

5.237 However, HCA again emphasises that the objective of the exercise when using comparators is to obtain the best estimate of the true cost of equity of a hypothetically quoted UK healthcare provider. As discussed further below, this is not necessarily achieved by some averaging of the betas of non-UK companies. There are two reasons for this. As noted above, in some of the countries the CC is proposing using as comparators, there are likely to be significant country risk premia. Further, capital markets are unlikely to be integrated, economies are not comparable, and neither is the healthcare market. But even for countries where economies are comparable and capital markets are likely to have a degree of

[338] E.g. see section 6 of http://stakeholders.ofcom.org.uk/binaries/consultations/823069/statement/statement.pdf
[339] CC, PFs, A6(14)14, para. 36.

integration (e.g. the US and UK), it is not sufficient to compare CAPM betas if the CAPM is known not to hold in the market where the comparator is listed.

Beta estimates: data frequency

5.238 In its response to the Profitability Working Paper, HCA argued that beta estimates should be based on monthly data "*as they constitute a closer proxy to annual data than weekly data estimates, and therefore provide a better matching of the ROCE and WACC analyses. In addition, over a five-year time period monthly betas are more likely to deal with potential non-synchronous trading problems in smaller stocks*". The CC has rejected HCA's arguments, stating that:

"*We do not agree that estimating betas from monthly data is necessarily preferable to using weekly data. Indeed, the latter permits a more statistically robust estimation due to the larger number of data points available for the calculation and hence the lower standard errors. In our analysis, we have taken into account both the weekly and monthly beta estimates produced by Bloomberg*".[340]

5.239 First, HCA notes that the CC simply quoted HCA's response but did not explain why HCA's arguments (i.e. better matching of the ROCE and WACC; potential non-synchronous trading problems) were not valid. In particular, thin trading and other market frictions can mean that short-frequency beta estimates can be biased, and need correction (Dimson, 1979; Cohen et al, 1983). Furthermore, there are issues around beta stability that can arise even in developed markets (Dimson and Marsh, 1983). Therefore, HCA believes that beta estimates should be solely based on monthly data for the purpose of this analysis.

5.240 Secondly, HCA finds it surprising that the CC claims that using weekly data yields more robust estimates and lower standard errors, and yet does not provide any evidence of this. HCA strongly contests this claim, especially as R-squareds for beta regression are actually higher when using monthly rather than weekly data.

Conclusion on WACC

5.241 Taking into account the analysis set out above, our estimates for the pre-tax nominal WACC for a UK private healthcare provider differ from the CC's in three respects:

- **Inflation**: we use an RPI figure of 3.5% taken from ONS data, rather than the CC's forward-looking assumption of 2%.
- **ERP**: we assume a market return range of 5.5% to 7.25%, resulting in an ERP range of 4.5% to 5.25%. This is in contrast to the CC's 4% to 5%.
- **Comparators**: we use a range of five US-based comparators, rather than the CC's broader range including comparators from Thailand, Australia, India and South Africa. Our base case asset beta based on these comparators is 0.89. Allowing for an uplift to take account of the high proportion of low-risk, government-backed revenues that our US comparators enjoy, we estimate an asset beta for a UK-based private healthcare provider of 1.22. In addition, we use the Fama-French 3-factor model to describe the level of risk in the market, and this results in an uplift to the assumed equity beta, primarily to take account of the size factor.

[340] CC, PFs, A6(14)12, para. 31

5.242 These parameters and the resulting WACC estimates are set out in **Table** A5.8 below.

		HCA's estimates		CC's estimates
	Standard CAPM	**CAPM adj. for Govt revenues**	**Fama-French**	
Cost of Equity (Ke)				
Real Risk-free Rate (r_f)	1.0% – 2.0%	1.0% – 2.0%	1.0% – 2.0%	1.0% – 2.0%
Assumed inflation rate (infl)	3.46%	3.46%	3.46%	2%
Nominal Risk-free Rate (a) = [(1+rf)*(1+infl)] - 1	4.5% – 5.5%	4.5% – 5.5%	4.5% – 5.5%	3.0% – 4.0%
ERP (b)	4.5% – 5.25%	4.5% – 5.25%	4.5% – 5.25%	4.0% – 5.0%
Equity Beta (c)	1.53	2.09	2.54	0.86 – 1.03
De-gearing rate	58%	58%	58%	n/a
Asset Beta (d)[341]	0.89	1.22	n/a	0.50 – 0.60
Post-tax real cost of equity (e) = r_f + (b x c)	**7.9% - 10.0%**	**10.4% - 13.0%**	**12.4% - 15.3%**	**4.4% - 7.2%**
Post-tax nominal cost of equity = [(1+e)*(1+infl)]-1	**11.6% – 13.8%**	**14.6% – 17.4%**	**16.3% – 19.3%**	**6.4% – 9.2%**
Cost of Debt (Kd)				
Risk-free Rate (f)	4.5% – 5.5%	4.5% – 5.5%	4.5% – 5.5%	3.0% – 4.0%
Corporate Debt Premium (g)	2.5% – 3.0%	2.5% – 3.0%	2.5% – 3.0%	2.5% – 3.0%
Corporate Tax Rate (h)	28.4%	28.4%	28.4%	28.0%
Re-gearing rate= D/(D+E) (i)	50%	50%	50%	50%
Post-tax Cost of Debt = (f + g) x (1 – h)	**5.0% – 6.1%**	**5.0% – 6.1%**	**5.0% – 6.1%**	**4.0% – 5.0%**
Post-tax WACC = (E x Ke) + (i x Kd) (j)	**8.3% – 10.0%**	**9.7% – 11.5%**	**10.7% – 12.7%**	**5.2% – 7.1%**
Pre-tax WACC = j / (1-h)	**11.7% – 14.0%**	**13.5% – 16.1%**	**14.9% – 17.8%**	**7.2% – 9.9%**
Sources: CC, HCA's own analysis				

Table A5.8 HCA WACC analysis

[341] The asset beta is derived from the average equity beta across the US comparator range, the US corporate tax rate (we assume 40% for the period in question), and the average gearing level for those comparators.

Interpreting ROCE

Key points

- The CC wrongly concludes that its observed high level of returns reflect a poorly functioning market.
- In reaching its conclusion, the CC's analysis fails to meet its own Guidelines by:
  - not considering whether the observed rates of return across all firms are consistent with a competitive market;
  - not assessing profitability over a sufficiently long period; and
  - not considering whether HCA's profitability is the result of legitimate sources of high profit rather than barriers to entry or competition problems.
- As explained in this response, HCA's success is attributed to a long history of risky investment, innovation, development of new markets and superior efficiency.

Introduction

5.243 The CC has taken its flawed estimates of ROCE and WACC and used these to support a finding of excess profitability in the market in general and for HCA specifically. HCA notes that the CC has provisionally found that:[342]

- BMI, HCA and Spire have persistently made profits in excess of their cost of capital;
- Ramsay has demonstrated a significant increase in profitability over the period;
- Nuffield has persistently made returns below its cost of capital; and
- BCH and TLC are making returns that are around their cost of capital on average.

5.244 The CC concludes from its profitability estimates that:

"*between 53 and 58 per cent of the market are making returns that are substantially in excess of the cost of capital indicates that there are some limitations in the competitive process*";[343] and

"*Our findings of excess profitability suggests that the price of private healthcare services may be high in relation to the costs incurred by private hospital operators… and thus higher than we would expect in a competitive market*".[344]

5.245 In this section HCA sets out its key concerns with the way in which the CC has interpreted the profitability estimates and highlights a number of crucial factors that need to be taken in to account to understand profitability in the private healthcare market. In HCA's opinion the CC's analysis of profitability in the private healthcare market is flawed for three main reasons:

- The CC's analysis does not consider whether the observed rates of return across all firms are consistent with a competitive market;

[342] CC, PFs, A6(13), para. 164.
[343] Para. 6.283 p245 PFR.
[344] Para. 6.284 p246 PFR.

- The timeframe over which the CC is assessing profitability – 2007 to 2011 – is particularly affected by special factors; and
- The CC has not considered whether HCA's profitability is the result of legitimate sources of high profit rather than barriers to entry or competition problems.

5.246 In this context, HCA notes the comments of a previous Chairman of the CC:

"*There is no per se reason why profits in excess of the cost of capital represent anything other than the effective working of a competitive market. It is only where profitability is a) substantially above the cost of capital b) across most or all companies in a market over c) a sustained period of time, that concerns arise*".[345]

5.247 In HCA's view, the CC's analysis in the PFs has failed to follow its own Guidelines relating to interpretation of profitability and contains no analysis of why HCA's observed levels of profitability arise from competition problems rather than the result of a successful firm in a competitive and dynamic market.

Evidence on profitability across the market

5.248 As the CC states in its Guidelines:

"*In practice, **a competitive market would be expected to generate significant variations in profit levels between firms** and over time as supply and demand conditions change, but with an overall tendency towards levels commensurate with the cost of capital of the firms involved. At particular points in time the profitability of some firms may exceed what might be termed the 'normal' level. There could be several reasons, including cyclical factors, transitory price or other marketing initiatives, and some firms earning higher profits as a result of past innovation, or superior efficiency*". (emphasis added)

5.249 In HCA's view the CC has failed to follow its own Guidelines in this regard and it has not properly considered the variability of profitability across the whole market. It:

- Overstates the portion of the market it has analysed;
- Neglects survivorship bias;
- Fails to understand the Fair-Bet principle; and
- Without any evidence, jumps to a conclusion of ineffective competition.

Portion of market analysed

5.250 As the CC states in its Guidelines, its reliance on profitability as an indicator of market effectiveness hinges on the assumption that there will be "*an overall tendency towards levels commensurate with the cost of capital of the firms involved".*

5.251 As discussed below in paragraphs 5.273 to 5.283, academic research shows that in competitive markets, some firms can persistently earn higher than average levels of profits. This means that the CC cannot robustly conclude on whether or not the market as a whole is earning excess returns without assessing the variability of returns across the entire market.

[345] Dominant Firm Behaviour under UK Competition Law , Sir Derek Morris, Chairman of the UK Competition Commission, Paper presented to the Fordham Corporate Law Institute, Thirtieth Annual Conference on International Antitrust Law and Policy, New York City, 23 to 24 October 2003.

5.252 The CC's profitability analysis has looked at only seven firms which it argues account for 74% of revenues. It then finds that of the seven firms analysed, three to four firms, accounting for 53–58% of revenues, are earning excessive returns.[346]

5.253 HCA is of the view that this overstates the proportion of the market the CC has analysed, especially in the case of London:

- **NHS PPUs**: This figure excludes NHS PPUs which account for 26% (by revenue) of the total UK market from its analysis.
- **Excluded segments**: In these figures, the CC has not included the market revenues from services such as IVF (which is an important service in HCA's revenue), cosmetic surgery (which is an important service in other private providers' revenue) and home infusions. Though these services are accounted for in the revenues of the private providers, the CC has not included their broader markets – which are dominated by other players: outpatient / ambulatory centres (IVF), dedicated cosmetic business (e.g., Harley Medical, Transform) and dedicated home-infusion companies (e.g., Healthcare-at-Home – with turnover > £1 billion, BUPA Home Healthcare).
- **Facilities overseas**: The CC's analysis of profitability does not take into account the fact that a large proportion of HCA's revenues ([✂]) comes from overseas patients who can choose to receive treatment in a number of different countries (in HCA's case principally the USA and Germany). Any meaningful interpretation of HCA's profitability must take into account the profitability of operators in those other markets if it is to meet the CC's objectives of assessing how competition is playing out.
- **Allow for success**: Revenue is a proxy of success, and one would expect that in markets with equal numbers of winners and losers, the winners to account for a greater share of revenues – as revenue is one of the ways in which success in a market can be measured.

5.254 The CC's profitability analysis fails to take into account the fact that HCA competes internationally for business for overseas patients. Overseas patients have the option of receiving treatment in a number of countries, most particularly the USA, Germany and Switzerland.

5.255 HCA's share of patients from individual countries varies by treatment, but, as the following charts show, it faces strong competition:

[✂]

Figure A5.10 HCA's market share for overseas patients[347]

5.256 **Figure** A5.10 shows that the UK's share of the market for HCA's main overseas patients is highly competitive, and that HCA's market share can in no way be argued to reflect market power.

[346] CC, PFs, A6(13)-5 para. 15.
[347] Source: Embassy Business Review, prepared for HCA by Boston Consulting Group, 11 June 2013.

Survivorship bias

5.257 The CC's profitability analysis is also subject to "survivorship bias" because it fails to consider profitability of operators who have exited the market. In the case of central London, in addition to mergers, there are a number of examples of operators who have failed:

- The Heart Hospital (Westmoreland Street, London) was sold to Gleneagles Hospital UK in 1994 and re-opened in 1997 as a private hospital specialising in cardiac treatment. This enterprise ran into financial difficulties in 2001 and was sold to University College London Hospitals which converted the hospital to do NHS work, moving the cardiac services that were then based at the Middlesex Hospital in Mortimer Street.
- The Italian Hospital (40–41 Queen Square, London) suffered financial problems and closed in 1990.
- In 2002, the Stamford Hospital (which was located in the Royal Masonic Hospital buildings in Ravensourt Park) struggled financially, and was bought by Hammersmith Hospitals NHS Trust, which converted the facility to do NHS work.

5.258 As can be seen, a number of hospitals – including St Martin's Healthcare – struggled in the period up to 2002 with a number of exits – HCA being the only purchaser willing to take the risk of buying and investing in these hospitals.

The Fair Bet Principle

5.259 In principle, markets value expected returns, rather than historic returns. Expected returns will reflect a range of potential outcomes. Actual ex post returns will inevitably vary from the expected ex ante returns, and there is a danger in competition analysis that "legitimate" higher than expected returns are misinterpreted as "excessive".

5.260 This risk of finding high ex post returns to be anticompetitive rather than resulting from a successful investment strategy have been considered by Ofcom in a connection with the regulation of Sky's Pay TV platform and also in the regulation of super fast broadband services.

5.261 In these cases Ofcom has referred to a "fair bet principle". This can be summarised as follows:

- Assume an investment ex ante has a 50% chance of generating a return of 5% and a 50% chance of generating a return of 25%. The expected return will be 15% ([50% x 5%] =+[50% x 25%]);
- The competitive market WACC is 15% and based on the expected return, a firm invests in the project;
- Ex post, the project is a success and generates a return of 25%; and
- This level of return, although higher than the market level WACC cannot, ex post, be viewed as "excessive" or reflective of market failure.

5.262 As Ofcom explains:

"*Where a successful outcome arises, the observed return derived in this state is likely to be higher than the ex ante expected return and in particular, higher than the cost of capital. Such a return may still however be reasonable. This is because when the investment was undertaken, there was an ex ante probability of failure and a lower return associated with this outcome. This probability of failure is likely to be greater initially but may diminish over time with respect to future tranches of investment.*

Therefore, when comparing the return achieved on a project in a successful state with the cost of capital of the project, an allowance should be made to reflect the fact that for a return to be deemed reasonable, it is the ex ante expected return, and not the successful state return, that should reflect the cost of capital".[348]

5.263 In HCA's view the CC's approach to assessing profitability needs to reflect this fair bet principle and the fact that high ex post returns can be consistent with a competitive market.

5.264 As outlined in section 5.335, HCA has continued to invest and innovate since entering the market. When others were exiting the market, it adopted a strategy, not followed by others in the UK market at the time, of buying hospitals, and focusing on high acuity, complex care and invested heavily in state of the art treatments and technologies in order to be able to provide its private healthcare to the highest quality. HCA has often been a market leader in adopting and introducing new treatments to the market. Examples of this are set out in paragraph 5.337. [✂]. HCA strongly considers that the CC needs to take this in to account, in line with the fair bet principle, when interpreting HCA's profitability levels.

5.265 In HCA's view, the CC must take into account the fairbet principle in its profitability analysis, and [✂].

Academic research on persistence of profit without market power

5.266 The CC's rationale for assessing profitability in the context of a market investigation hinges on the premise that profits will trend towards the cost of capital. There is a substantial amount of academic research in this area, which, if nothing else, shows that there can be many reasons for firms to earn high levels of profits, and that these can persist in competitive markets:

5.267 Waring identified a number of variables which contributed to a firm's ability to persistently earn high levels of profit:

"*The variables that have the largest effect on persistence (in descending order) are skill, the degree of unionization, consumer purchases as a percentage of output, the number of firms, economies of scale, and R&D intensity. The reported findings support theories of informational impediments to imitation, expropriation by labor, switching costs, rivalry, and economies of scale for explaining persistence. Theories of sunk costs and cyclical capacity use are supported also, but qualified by possibly being a spurious correlation between their*

[348] Ofcom, Provision of Technical Platform Services Guidelines and Explanatory Statement, 21 September 2006 A4.4-5.
http://stakeholders.ofcom.org.uk/binaries/consultations/tpsguidelines/statement/statement.pdf

proxy and measurement error (Fisher and McGowan, 1983), since R&D and capacity investments are rarely depreciated at their true economic rates".[349]

5.268 McGahan and Porter identify three different factors that can contribute to a firm's ability to persistently earn high levels of profitability:

- Business specific factors which refer to effects that are idiosyncratic to a firm's operations in a specific industry;
- Corporate parent factors which refer to the effects of a diversified firm on its member businesses; and
- Industry specific factors – affecting an industry as a whole.[350]

5.269 Dennis Mueller has undertaken a significant amount of research into the question of the persistence of profits. His empirical work demonstrates that individual firms can persistently earn higher than average returns over very long periods. In a major study for the FTC in 1983, Mueller looked at the profitability of 1000 firms over the period 1950–1972. A second study in 2008 comprised case studies of eight US and UK companies which had displayed track records of long term above and below average performance.

5.270 In his 1983 paper, Mueller concluded:

"*The results presented strongly reject the competitive environment hypothesis [that firm's profits would trend towards the average]. Profits when once above the norm persist at above competitive levels into the indefinite future, and the difference is substantial*".

"*Somewhere between 30 and 60 percent of the deviations in profit rates across firms observed in 1950- 52 are projected to persist indefinitely*"[351]

5.271 In their 2008 paper, Mueller and Cable[352] looked at eight UK and US firms. Their research looked at firms over 50 years for the US and 32 for the UK, and identified that some firms were able to earn excessive profits for very long periods.

[349] Industry Differences in the Persistence of Firm-Specific Returns: Geoffrey F. Waring: The American Economic Review, Vol. 86, No. 5 (Dec., 1996), pp. 1253–1265.
[350] The Persistence Of Shocks To Profitability, Anita M. McGahan and Michael E. Porter.
[351] The Determinants Of Persistent Profits An Empirical Study Dennis C. Mueller *University of Maryland* Consul Tant's Report To The Bureau Of Economics Of The Federal Trade Commission June 1983 http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.187.1517&rep=rep1&type=pdf
[352] Testing for Persistence of Profits' Differences Across Firms, John R. Cable) and Dennis C. Mueller *http://www.intertic.org/new_site/wp-content/uploads/Policy%20Papers/Mueller.pdf*

5.272 Figure A5.11 below shows the deviation of profits from the "average" for a range of US and UK companies – any value higher than 0 represents "excess":

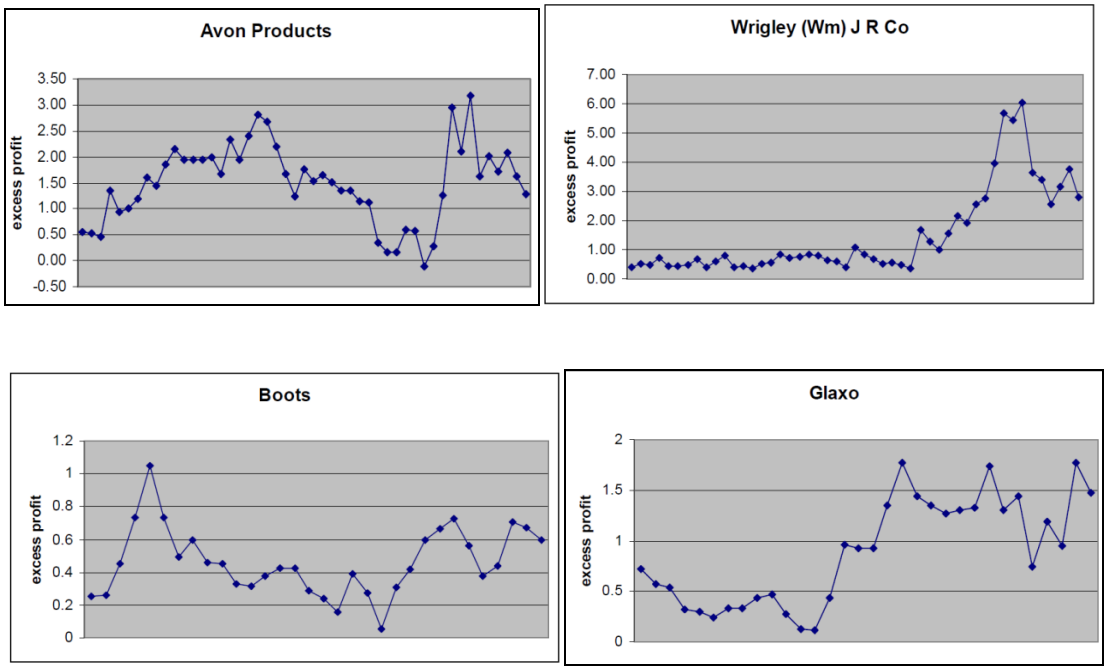

Figure A5.11 Persistence of profits – evidence from the UK and USA

5.273 As Cable and Mueller note: "*It suffices to answer the question of whether market competition drives all company profits to the same competitive level to know that it has not done so for the last 35 years in the UK and 50 years in the USA*".[353] Whilst the academic researchers may disagree on the interpretation of the empirical data, they all accept that some firms earn higher levels of profit than others and that this can occur for a persistent period.

5.274 This finding was also reached by Waring,[354] who analysed profitability in the US car industry. As shown in **Figure** A5.12 and **Figure** A5.13, he found that whilst returns across the market tended to converge, the same was not true for individual firms:

[353] Page 27.
[354] Industry Differences in the Persistence of Firm-Specific Returns: Geoffrey F. Waring: The American Economic Review, Vol. 86, No. 5 (Dec., 1996), pp. 1253–1265.

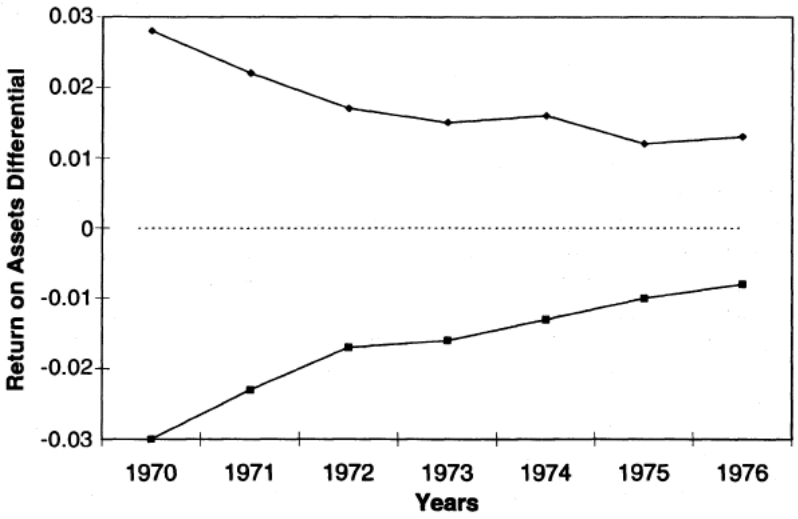

FIGURE 1. CONVERGENCE OF FIRM-SPECIFIC RENTS

Notes: To create the graph (similar to Pankaj Ghemawat [1991]), I ranked the 3,617 firms in the Compustat database in 1970 by their return on assets (ROA), minus their industry's mean ROA. The average annual ROA for the top half (♦) and the bottom half (■) of this ranking are plotted for the next six years.

Figure A5.12 Convergence of average returns across a market[355]

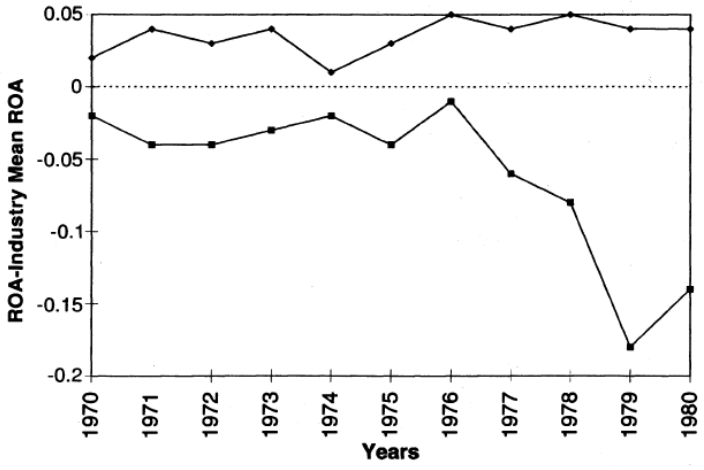

FIGURE 2. BIG-THREE AUTO MANUFACTURERS' RETURN DIFFERENCES, 1970–1980

Notes: Diamonds (♦) depict the difference between General Motors and Ford; squares (■) depict the difference between Ford and Chrysler.

Figure A5.13 Persistence of differential in returns between companies[356]

[355] Industry Differences in the Persistence of Firm-Specific Returns: Geoffrey F. Waring: The American Economic Review, Vol. 86, No. 5 (Dec., 1996), pp. 1253–1265.

[356] Industry Differences in the Persistence of Firm-Specific Returns: Geoffrey F. Waring: The American Economic Review, Vol. 86, No. 5 (Dec., 1996), pp. 1253–1265.

5.275 The CC itself has recognised this issue in previous cases. The CC noted in its decision on mobile call termination rates:

"*It appeared that Vodafone at least had been making profits in the UK in excess of its cost of capital over the period 1998 to March 2001."*

"*However, when deciding whether persistently high profit levels are an indicator of ineffective competition, it is necessary to consider the circumstances in which such returns are earned. Vodafone's returns have been earned in a period when the mobile phone market has been expanding extremely rapidly. In our view, the circumstances in which persistently high profits become an indicator of ineffective competition is a matter of judgement, about which contrary views may legitimately be held. In the circumstances, we do not conclude that Vodafone's high profit levels, whether they have been declining (as Oftel believed) or remain approximately constant but at a lower level (as Vodafone's evidence indicates) demonstrate, in themselves, ineffective competition".*[357]

5.276 In this mobile calls case the levels of excess profitability were much higher than in HLA's case: Vodafone's ROCE was calculated by Oftel to be between 48% and 72%, compared to a cost of capital of 14%.[358]

5.277 In HCA's view the CC has failed to consider, as it did in the mobile calls case, whether or not high levels of profitability could reasonably be attributed to competition problems. As the CC noted in the mobile calls case – especially in a market facing significant discontinuities – one can observe high and persistent profits with effective competitive constraints.

Conclusions on evidence of profitability across the market

5.278 In summary, HCA contends that in reacting to HCA's profitability, the CC overstates the portion of the market it has analysed, neglects survivorship bias, fails to understand the fair-bet principle, and prematurely jumps to the conclusion of ineffective competition – without allowing for the fact that there is both variation and persistence in profitability in competitive markets.

Period of Profitability Analysis

5.279 HCA strongly considers that the CC's decision to limit its analysis of profitability to a five year period means that the results of this analysis will be insufficient for it to understand the development of the market and reflect appropriate investment lifecycles. It is too short to enable any robust conclusions to be drawn about whether any levels of profit are "substantial" or "persistent" – especially when one considers the special factors that have affected the five years that the CC has chosen: 2007–2011.

5.280 The CC states in its Guidelines:

"***The appropriate time period over which to examine the persistence of the gap between profitability and the cost of capital may therefore vary according to the specific market****. The pattern of investment and the nature of sources of competitive advantage advertising, research and development (R&D), more efficient production) may*

[357] Vodafone, O2, Orange and T-Mobile Reports on references under section 13 of the Telecommunications Act 1984 on the charges made by Vodafone, O2, Orange and T-Mobile for terminating calls from fixed and mobile networks (para. 2157 and 2161).
[358] Ibid.

affect the CC's view of the relevant timescales over which it would expect to see competition playing out in the market. ***Where large and risky investments have been made, the CC would expect to see a normal level of profitability restored over a relatively long timescale***" (emphasis added).[359]

5.281 HCA considers that the CC has failed to apply its own Guidelines in assessing profitability. Specifically:

- The CC has chosen a period of analysis based on precedents rather than the requirements of this specific case.
- The CC's approach will not enable it to *'see competition playing out in the market'.*

5.282 HCA also considers that the five years chosen by the CC (2007–2011) have been affected by very unusual factors. Specifically, the period was unusual because of the:

- Changing demands from the Middle East;
- Financial climate for new entry; and
- Particular state of the competitors.

5.283 Despite these issues, HCA's view is that the market is responding as one would expect, with growth and entry. In the remainder of this section, HCA expands on three key points in relation to entry and expansion in the market, showing there has been:

- Unprecedented entry in the Middle East;
- Competitive entry in London; and
- Dramatic growth of NHS PPUs.

Precedents cited by the CC are not relevant to the private healthcare market

5.284 As noted in section 3, HCA considers that the CC's approach to assessing the private healthcare market is flawed due to, amongst other issues, the failure of the CC to take into account key features of the market. These include the role of investment and innovation in the market and the crucial role that these play in driving improvements in quality and patient outcomes (which are of key importance to consumers). The failure to take account of the specific features of the private healthcare market is again demonstrated by the CC's use of inappropriate precedents to justify the approach it has adopted in this market investigation.

5.285 The CC states that "*a five-year period is usually considered a representative and sufficient period over which the outcomes of any competitive process might be demonstrated*"[360] and notes that this period was used "*in a number of previous market investigations, including Local Buses, Home Credit and Aggregates*".[361]

5.286 It is HCA's strong view that the [industry] structure and investment lifecycles of the industries cited are clearly very different to a private healthcare provider and are totally irrelevant in the context of this market investigation:

[359] Para. 121 CC Guidelines.
[360] A6(13) para. 18.
[361] Footnote 15 A6(13)-6.

- First, in the local buses investigation, the CC stated that "*we did not think that capital expenditure in this industry was particularly 'lumpy' in nature*". This can be contrasted with the private healthcare sector where investment in new hospital facilities is clearly "lumpy". In section 3, HCA describes a number of key investments that it has made in its facilities over time. In addition, it has made a number of sizeable investments in expanding the range of services it provides (for example investing in critical care units in each of its hospitals) and introducing new technologies such as CyberKnife and the da Vinci robotic surgery system. This is reflected in its investment patterns. HCA considers that this "lumpy" investment pattern applies across all hospital providers, even where the scale of investment made by other private healthcare providers may not be comparable to HCA's.

- Secondly, the home credit market was described by the CC as "*a mature market which has been in a steady state for many years*" in deciding that five years was an appropriate period. The rate of growth, changes in market structure and new technologies all indicate that the private healthcare market, particularly in London cannot be described as mature. Indeed, the CC acknowledges itself the changes that have occurred in the private healthcare market over recent years.[362] Furthermore, the evidence that HCA sets out in section 6 suggests that given the likely and planned new entry and expansion of providers in the London market (as well as in markets that compete for the international patients that are a key driver of HCA's profitability), clearly demonstrate that the market where HCA operates is far from being in steady state.

- Thirdly, in the Aggregates investigation, the CC argued that a lack of data prevented it from undertaking its profitability analysis, but that it would separately consider margin data over a longer period in its analysis – it looked at seven years' worth of data.

A five year period is insufficient to "see competition playing out in the market"

5.287 The CC's Guidelines indicate that the period of analysis should be sufficiently long for it to see the impact on profitability of competition playing out in the market. [363]

5.288 However, in its analysis the CC deliberately excludes a period of market change in which competition was actively reshaping the market. The CC states that it considered whether it would be appropriate to assess profitability over a period longer than five years but concluded that it was inappropriate to do so because of:

"*significant changes in the structure of the industry that took place between 2006 and 2008*".[364]

5.289 In HCA's view, the fact that the industry was subject to change between 2006 and 2008 does not mean that the CC should ignore in its analysis profits made in this period (or earlier). On the contrary, an analysis that aimed to capture a period of time during which competitive forces could be seen as "playing out" would necessarily have to include periods of change. Not doing so would amount to artificially selecting a period of time that was short enough not

[362] A6(13) para. 19.
[363] Para. 121 CC Guidelines.
[364] A6(13) para. 19.

to experience those structural changes that are a natural recurring pattern in markets where innovation and quality changes are possible and important.

5.290 A consideration of HCA's margins in years before the CC's analysis shows they were lower than during the five-year period during which the CC assesses profitability, as shown in **Figure** A5.14 below.

[✂]

Figure A5.14 HCA EBITDA Margin

5.291 **Figure** A5.14 shows that between 2001 and 2005 HCA was earning lower EBITDA margins than in subsequent periods, including the period 2007–2011 assessed by the CC. In HCA's view this illustrates that the CC's analysis of five years is insufficient to see competition play out in the market by taking into account the investment lifecycles and time it takes the market to respond to changes. The market is a dynamic innovative one where private hospital operators, particularly HCA, vigorously compete to introduce new treatments reflecting the latest medical advances and state of the art technologies, in order to attract patients. A five year period, therefore, is insufficient to see the risk and reward associated with these constant new investments play out in the market.

5.292 Indeed, given the size of some of the investments made by HCA (including hospital acquisitions) and given the lack of maturity in the London and international markets (with significant growth in London, and planned entry), it seems clear that even a 10 year period would not be sufficient to fully evaluate the processes of entry, product development, expansion, and exit that clearly characterise the provision of high quality healthcare services.

The changing demand from the Middle East

5.293 The CC has also not considered the unusual nature of the period it has examined (2007-2011). This period was affected by an unprecedented increase in demand from the Middle East, a once in life-time financial crisis affecting new entry and a set of unusual circumstances of other private hospital groups who were not in a position to make major investments.

5.294 This period saw an unprecedented increase in demand for foreign healthcare from the Middle East due to an extraordinary and sustained increase in the population. The increase coupled with an increase in wealth brought about by an increase in oil prices resulted in dramatic increase in people travelling for healthcare.

5.295 The increase is in both population and wealth have the oil-price increase as their underlying cause. The oil price was roughly $40 per barrel or less for the 15 years up to 2003. Since then, however, the price has exceeded $100 on average (apart from a short period around 2008–2009).

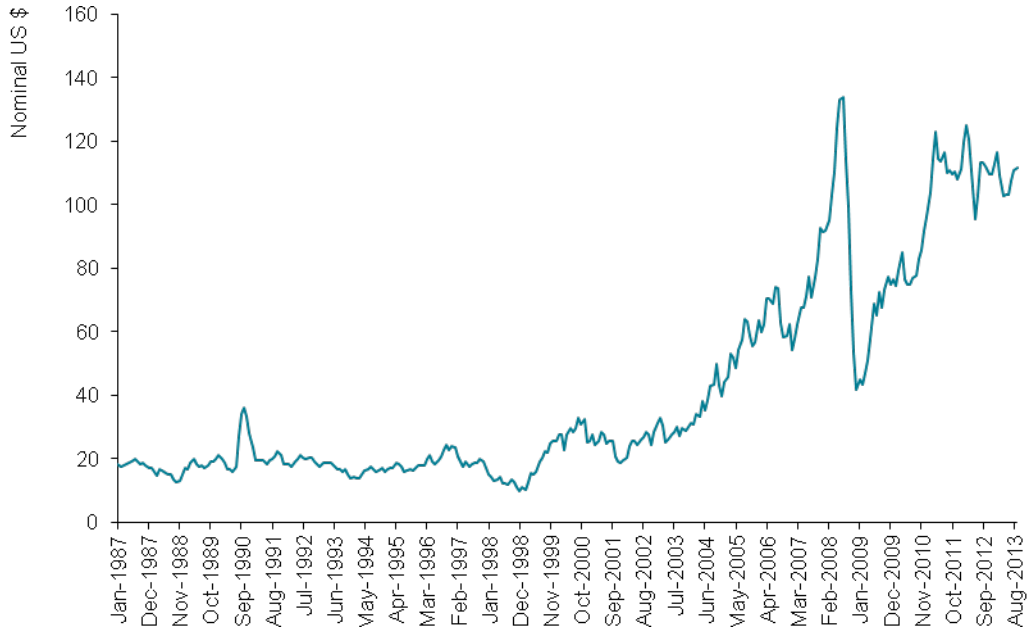

Figure A5.15 Oil Prices over the period 1987 to 2013

5.296 The result of this oil price spike was the dramatic growth in population of some Middle Eastern oil exporting countries. In the UAE, the population jumped from around four million in 2005 to around 10 million today. Qatar is now seeing a similar growth.

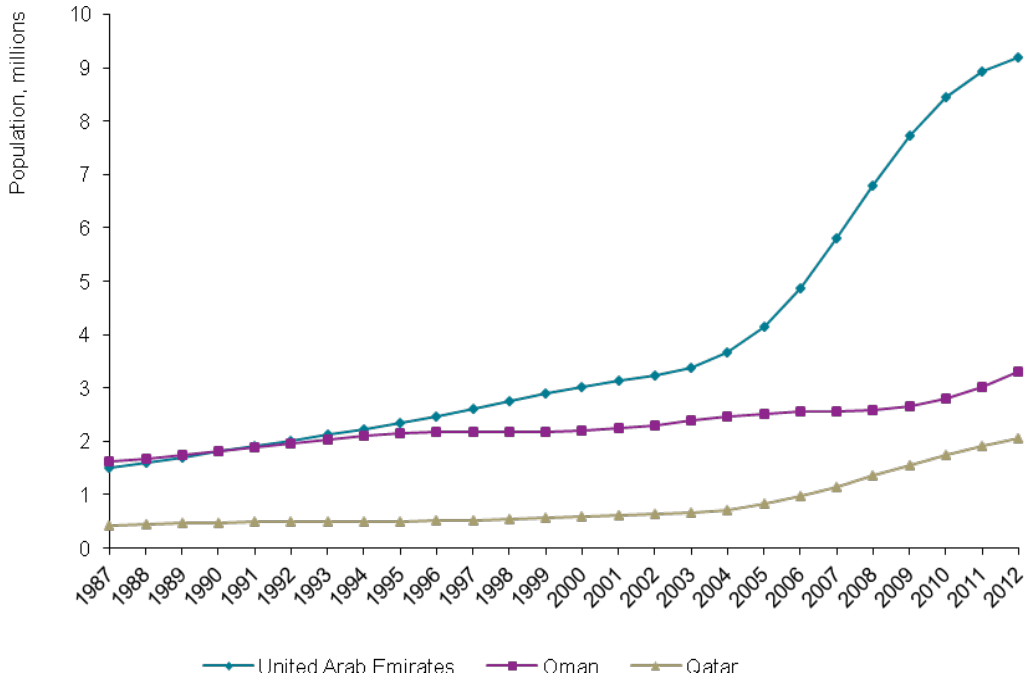

Figure A5.16 Population growth in the Middle East

5.297 The population increase put strain on the indigenous health systems in these countries. And even where the population did not jump, the increase in wealth allowed these countries to export demand. The net result is the dramatic and sustained increase in medical transfers abroad (MTAs).

5.298 The growth in demand from the Middle East has stimulated a significant expansion of hospital capacity in the Middle East, which will directly compete for HCA's overseas patients as shown in **Table** A5.9 below.

	Building Completion Period	**Total Beds Added**	**Project Value ($m)**
Saudi Arabia	2004–2018	21,410	17,158
Kuwait	2007–2016	7,733	8,406
UAE	December 2010 – Second Half 2014	4,631	8,268
Oman	July 2012 – 2016	2,420	3,044
Qatar	2003 – December 2014	1,650	1,874
Jordan	2007–2017	350	251
Bahrain	March 2010	312	213

Table A5.9 Middle East Hospital Expansion, Middle East Zawya database

5.299 The entry in the Middle East will have the clinical quality to match London teaching hospital quality.

- **Cleveland Clinic, USA** has partnered with Mubadala Healthcare to set up Cleveland Clinic, Abu Dhabi, a 360 bed multi-speciality hospital, which is expected to meet 50% of healthcare needs in the emirate.
- **Sidra Medical and Research Center, Qatar**, an AMC designed to offer best in class specialty care for women and children is slated to open in 2013 with 338 beds.
- **SickKids, Canada** has entered into a five year partnership with HMC since 2010, to provide consultation and help establish the new Children's hospital in Qatar, a 217 bed facility.
- **RED House Group and Risk Healthcare, Lebanon** has announced the development of a chain of 10 specialised hospitals and 3,000 beds spread over Saudi Arabia, with a total investment of $1.35 billion.
- **John Hopkins Medicine International, USA** and Saudi Aramco have signed a joint venture to establish a new health care provider which will provide clinical services, research and education to 350,000 members of the Saudi Aramco community.

- **Five medical cities with 5000 beds** in tertiary/quaternary care are being set up in Saudi Arabia as part of the five year program to transform healthcare delivery in the Kingdom.

- **Cleveland Clinic, USA** took over the management of SKMC, a 550 bed acute care hospital in Abu Dhabi in 2007.

- **DNA Health Corp, USA** has set up the "DNA Center for Integrative Medicine & Wellness" at Saadiyat Island in partnership with Abu Dhabi's Tourism Development & Investment Company.[365]

5.300 HCA expects that this increased competitive pressure will make it more difficult to attract overseas patients to its hospitals and that it will need to continue to offer the highest quality accommodation, treatment and innovative services if it is to continue to be successful in this market.

5.301 This increase in demand raised the profitability of many players in the years studied by the CC. This was a rare set of circumstances – and one – as shown below – which is unlikely to last with unparalleled hospital construction in the Middle East.

Financial climate in the period assessed by the CC

5.302 The period assessed by the CC was unique for another set of reasons: the UK (and world) was subject to an unprecedented banking crisis.

5.303 The CC has interpreted the impact of the recession as one which has depressed profits:

"*As a result of this recession, it seems likely that expenditure on private healthcare services, although resilient, would have been depressed relative to a situation in which the UK economy was growing. Consequently, our estimates of profitability may understate the returns that could be earned in more 'normal' market conditions*".[366]

5.304 In HCA's view, there is limited evidence of a "recession" in private healthcare in London with independent and NHS PPU providers seeing sustained growth. The more significant impact has come from the banking crisis – which has had a dampening effect on investment and new entry.

5.305 As shown in detail in the WACC section above, healthcare firms are highly leveraged – and new entry relies significantly on debt for finance. However, in this period the debt markets seized up, and were effectively "closed" for a significant period of time.

5.306 Firms that would have otherwise expanded had to focus on cash conservation – for they did not know when the debt markets would "re-open," suspending any plans for expansion which would have relied on a non-existent debt market.

[365] Sources, Literature review and press search.
[366] Para. 184, A6(13)-69.

Specific situation of UK healthcare firms

5.307 HCA contends that the five-year period examined by the CC is also unusual for a third reason: the particular circumstances of the other UK healthcare providers.

5.308 A number of hospital groups – in addition to HCA – are of the scale to contemplate a new London hospital: Nuffield, BMI, Ramsay and Spire. Partly due to the financial crisis, these hospital groups found themselves unable to expand further in this period:

- **Nuffield**, which had built de novo hospitals regularly in prior periods (e.g., Oxford, Leeds) acquired Cannons Health & Fitness Clubs in 2007, and was focused on integrating that business into its group.
- **BMI** was acquired in a highly-leveraged buy-out in 2006. Unable to refinance (as had been possible in prior periods), the group has been unable to allocate significant capital for expansion.
- **Spire** was also acquired in a leveraged buy-out in 2007. Like BMI, Spire has not been able to refinance with the ease that was possible before. It was able, however, to perform a "sale-and-leaseback" on its property earlier this year, allowing it to consider new investment. It was no coincidence, therefore, that it has sought to expand in London (see below).
- **Ramsay** bought Capio's UK operations in 2007 for a total of £193 million. So it too was affected by the problems of integration. But a London entry of even £20 million would have amounted to 10% of its total size.

5.309 HCA considers these the circumstances to be unusual, and that they will not last. In London, HCA faces increased competition from NHS PPUs, new hospital operators entering the London market and expansion by existing competitors. Overseas, HCA faces significant expansion of hospital capacity in the Middle East, which will directly compete for HCA's overseas patients (as discussed above).

Competitive entry in London

5.310 As explained in section 6 of this response, HCA expects to see increasing competition and entry into the London market:

- C&C Alpha Group are currently in the process of developing the London International Hospital; and
- Spire has advertised for property to expand in central London.

5.311 Together with increased competition from PPUs it is clear that the market for private healthcare in London is currently dynamic and vibrant, and can in no way be regarded as stable or mature.

Dramatic and ongoing growth of PPUs in London

5.312 NHS PPUs are actively looking to increase their revenues from private patients and will provide a strong competitive constraint in central London for certain treatments. The competitive constraint of the PPUs is discussed in detail in HCA's discussion in sections 5 and 6 and Appendix 1 of this submission. The CC's analysis of profitability fails to take account of the impact of PPUs in a number of areas:

- The CC's analysis of market returns fails to include the profitability of PPU units. Nine of the top 10 PPUs by revenue are in London and account for half of the total private patient income in the UK overall;
- The revenues of London PPUs have grown by 36% between 2009/10 and 2013; and
- This high rate of growth is expected to continue.

5.313 It is clear that the increased capacity for private patients at London NHS hospitals will have a significant impact on the private healthcare market which the CC should consider in its interpretation of profitability.

Risk and innovation

5.314 In a market where expansion is characterised by either lumpy investment or high risk innovation, the disequilibrium of profits in excess of the cost of capital could be expected to persist longer than in other markets which other may consider too risky to follow until they can see that either the innovative investments work, or that the demand growth will continue. Furthermore, a particularly innovative firm making a sequence of innovative investments such as HCA, that others are slow to follow should be expected to show more persistence.

Conclusions

5.315 In HCA's view, taken together, these factors demonstrate that:

- The CC has not followed its guidelines and that the five years it has studied are not sufficient to conclude on the effectiveness of competition being played out;
- The five years that the CC has studied are highly unusual because of the exceptional demand and supply circumstances prevailing at the time; and
- Despite all this, the markets for private healthcare in London and for the private healthcare of Middle East nationals that may seek treatment abroad are dynamic and competitive, with unprecedented response.

5.316 In summary, the period of the CC's analysis, 2007–2011 is not representative of profitability in the future, or of competition playing out.

5.317 As stated by a former CC chairman:

"*There is no per se reason why profits in excess of the cost of capital represent anything other than the effective working of a competitive market. It is only where profitability is a) substantially above the cost of capital b) across most or all companies in a market over c) a sustained period of time, that concerns arise*" .[367]

5.318 HCA contends that the evidence clearly indicates that none of these conditions apply to the markets in which HCA is operating and that therefore the CC is wrong to conclude that high levels of profitability indicate a poorly functioning market or high barriers to entry in London.

[367] Dominant Firm Behaviour under UK Competition Law , Sir Derek Morris, Chairman of the UK Competition Commission, Paper presented to the Fordham Corporate Law Institute, Thirtieth Annual Conference on International Antitrust Law and Policy, New York City, 23–24 October 2003.

The reasons for HCA's success

5.319 The CC notes in its own Guidelines that:

"*There could be several reasons, including **cyclical factors**, **transitory price** or other **marketing initiatives**, and some firms earning higher profits as a result of past **innovation**, or **superior efficiency***" (emphasis added).

5.320 HCA notes that a former chairman of the CC highlighted the need to understand the reasons for high levels of profitability before being able to conclude that they resulted from competition problems:

"*All of this leads me to think that any backward looking analysis of profitability should have two components: a measurement exercise (answering the question: 'are profits persistently high?'), and an analysis of profitability (answering the question: 'why are they high?'). While a Phase I investigation might well focus on the first question, it is difficult to imagine any Phase II investigation which relies on backward profitability analysis being complete if it has not addressed – and answered – the second question*".[368]

5.321 In HCA's view, HCA's profitability can clearly be attributed to the very factors which the CC agrees can be a source of high profit. The cyclical factors have been explored in detail above; this section focuses on innovation and superior efficiency. In particular, HCA contends that:

- Its innovation of focusing on acute and tertiary care allowed it to benefit from the Middle Eastern Market far more than its UK competitors;
- Its sustained and repeated innovation and investment over the period of study and beyond – much like a pharmaceutical company with a pipeline of new drugs – allowed it to stay one step ahead of the market;
- Its high and growing levels of utilisation; and
- Its efficiency and operating disciplines allowed it to earn a differential return.

Focus on tertiary care and international patients

5.322 For HCA, a key source of profitability has been its overseas patients, and this market has displayed clear cyclical features – a surge in demand from the Middle East driven by considerable income increases resulting from oil price increases. The importance of the overseas market to HCA is described here.

5.323 In its profitability analysis, the CC concludes that

"*we do not consider that there is any evidence to support HCA's contention that it earns a higher return on overseas patients than on UK patients*".[369]

5.324 The CC is wrong in its assessment of the profitability of HCA's overseas patients. It is true that [✂]. However, overseas patients' return on capital employed is much greater because the absolute £ return per unit of capital is greater for them because of their greater acuity.

[368] Profitability Analysis and Competition Policy, Professor Paul A Geroski, Chairman, Competition Commission, 8 February 2005.
[369] A6(13)-56 para 150.

5.325 This is fundamentally caused by the fact that more acute and complex patients have a better return on capital, and international patients are more acute and complex.

HCA achieves a better return on capital for acute patients

5.326 Acute patients have a greater mix of treatments. In particular, more acute patients tend to require:

- much higher levels of support, in terms of nursing, and physiotherapy;
- longer stays in higher dependency beds (ITU and HDU);
- more expensive drugs; and
- more frequent testing (bloods and imaging).

5.327 As a result of the higher level of care required, the average revenue per day per high acuity patient is higher than for low acuity patients – as illustrated in the figure below – cardiac services, intensive care, hepatology, paediatrics, BMT, neurosciences, and haematology (seven of the nine highest contribution services) are high acuity services.

[✂]

Figure A5.17 Contribution by treatment type

5.328 On the other hand, the use of the infrastructure, or assets, of the hospital by the two types of patient does not vary by the same proportion – in particular both require one bed per day. In terms of profitability analysis, this means that the "capital employed" for a high acuity patient as a proportion of revenues is much lower than for a low acuity patient, i.e. the level of capital intensity for these patients is lower.

5.329 The net result of this is that high acuity patients have a better return on capital.

5.330 Because of HCA's past investment and focus on acuity (all of its hospitals have ITU), it put itself in a position to earn a differential and better return. This was doubly rewarded by the growth of patients who were able to travel for their care from the Middle East (see above for the reasons). This phenomenon resulted in HCA's differential returns being further enhanced.

International patients are more acute, requiring more complex care

5.331 The fundamental reason for this is because HCA's international patients are more acute as shown in **Figure** A5.18 below. Less acute patients are not prepared to travel because the better care is not worth the inconvenience of travel when the condition is not serious. Domestic patients, on the other hand, are able to depend on the NHS – which is where an ambulance takes the patient; and which is where acute patients have had a history of being treated. As a result, HCA's domestic patients are – on the whole – less acute.

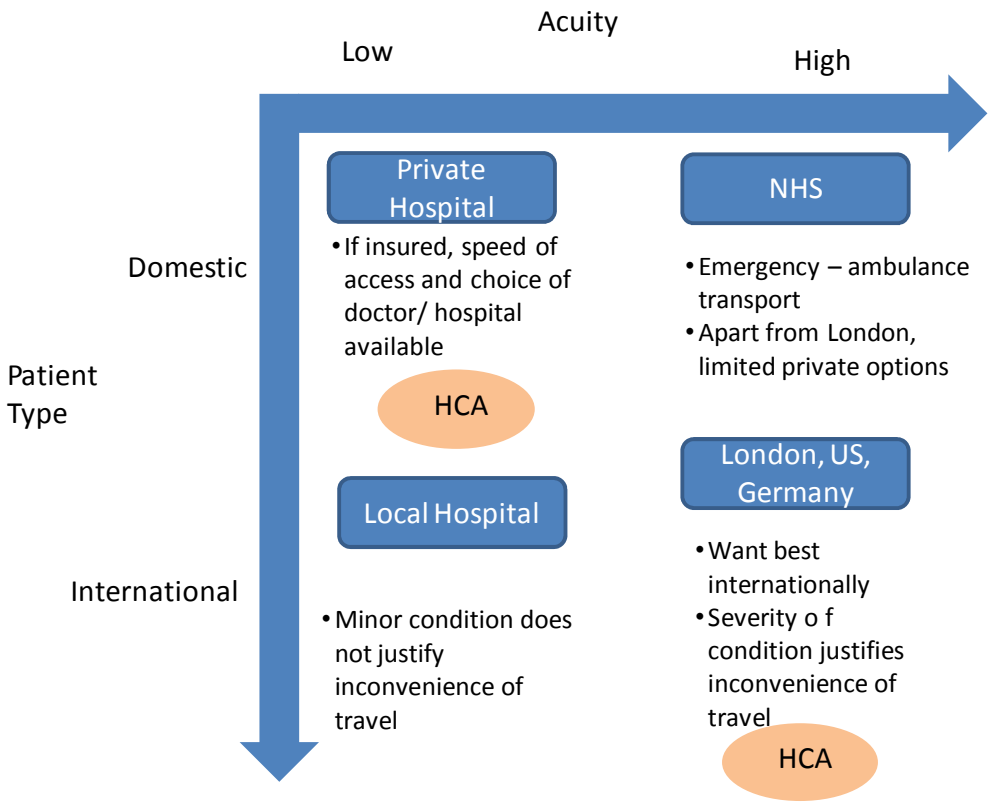

Figure A5.18 Natural location of domestic and international patients by acuity

5.332 This results in greater profitability from international patients. The average inpatient contribution across all treatments and customer groups is [✂] per day. For overseas patients however, the average contribution is [✂], and for UK patients, [✂]. As can be seen in the chart below, for all services with contribution of greater than [✂] per day, over [✂] of the patients are international (apart from cardiology), and for those services with less than [✂] per day in contribution less than [✂] is international.

[✂]

Figure A5.19 Contribution per Patient Day Vs Overseas Contribution Proportion 2011 FY *(exc Rehab & Cardio)* [370]

5.333 The fact that HCA has a much higher proportion of high acuity patients than its competitors and has benefited by the growth of Middle Eastern demand means it could earn a higher ROCE than its competitors.

5.334 The CC commented on overseas specific costs in the PFs. In particular, [✂] in total in 2013. This figure includes the cost of interpreters hired after the end of the CC's inquiry period (December 2011), which means that the figures for years previous to 2011 is likely to be much smaller. HCA notes that these costs are consistently less than [✂] of HCA's overall cost base, and therefore have a [✂] impact on the cost allocation to overseas patients.

[370] Source: HCA Analysis.

Sustained and high levels of investment and innovation

5.335 In HCA's view, the private healthcare market, and in particular, the private healthcare market for high acuity services – in which HCA excels, is characterised by constant innovation and risky investment subject to an uncertain level of demand.

5.336 HCA is amongst the highest investors in high acuity healthcare. HCA notes that its level of capital investment, expressed as a percentage of revenues, is higher than its UK competitors and other European benchmarks, as shown in **Figure** A5.20 below.

[✂]

Figure A5.20 Capex as % of revenues[371]

5.337 HCA has a track record of innovation in new treatments and treatments. These are described in Appendix 6. HCA's commitment to investment and innovation is recognised by the UK healthcare industry:

"*HCA's very substantial and consistent investment in its hospitals, staff and clinical technologies has been a major influence on strengthening London's global reputation as a medical centre of excellence….HCA offers the very latest treatments and takes great care of its patients. This is a compelling and customer focused combination of skills".* – Imperial College London Professor of Health Policy, Nick Bosanquet at the Award Ceremony at which HCA received the 2012 Laing & Buisson, "Laing's Healthcare 20" award.[372]

5.338 Not to take into account the value of these investments in explaining HCA's profitability would simply amount to a blatant case of "efficiency offense" where a firm's risk-taking and efficient management is penalised because the competitive process rewarded it.

5.339 The OFT has previously considered the difficulties of using profitability as a tool in competition analysis where levels of investment and innovation are high. Its discussion paper concluded that:[373]

"*Measuring profitability is a poor way of conducting competition policy in standard industries. It is likely to be even worse in high technology industries. The very high ex ante risks of failure mean that the returns to 'winners' in high technology markets should be very high. We conclude that the risks of ex post appropriation of rewards that were not ex ante excessive are very high and that competition authorities should avoid using profitability measures in high technology industries*".[374]

"*It is important to understand that if, once a round of the competitive process is over and a winner is enjoying high profits, the authorities then intervene and take enforcement actions that significantly reduce those profits, this can have a very chilling effect on future investment in innovation*".[375]

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[371] Source: HCA analysis of published accounts.
[372] http://www.hcahospitals.co.uk/about-hca/our-awards/
[373] Innovation and competition policy, Part I – conceptual issues Economic Discussion Paper 3 March 2002 OFT377 Report prepared for the Office of Fair Trading by Charles River Associates.
[374] Para. 1.20.
[375] Para. 3.6.

5.340 In HCA's view, the CC's interpretation of profitability in the private healthcare market needs to explicitly recognise the risks attached to the investments made by HCA in order to develop the market. Its repeated and successful investment and innovation is another reason for HCA's returns and profitability.

High levels of utilisation

5.341 Hospitals – once built – have a level of fixed capital. And if that capital is utilised more intensively, the return grows correspondingly. And – because of its new services, innovation and investment, HCA has been able to grow its utilisation, and grow its return – another reason for its returns and profitability.

5.342 **Figure** A5.21 below shows the midday occupancy rates for all of HCA's central London hospitals. This measure captures at a high level the [✂] and provides evidence that HCA has been able to steadily increase utilisation of its hospitals, and thus increase its returns. It should be noted that HCA believes that it has a higher level of utilisation than the market.

[✂]

Figure A5.21 Hospital Utilisation

HCA's efficient operating disciplines

5.343 Superior efficiency can be one explanation for a firm's observed higher profitability levels compared to other firms in the market. HCA strongly considers that it is a highly efficient private healthcare provider and this also explains its profitability. For example, a key source of HCA's ability to operate efficiently to provide high quality care and control costs is its staff planning system.

5.344 HCA invests heavily in staff planning – a division director for Management Engineering is a key part of Head Office staff responsible for building, maintaining, training and using these planning tools to ensure effective and efficient staffing which differentiates the level of service provided.

5.345 These tools and processes have been in use for over a decade in all 14 HCA Divisions in the USA, involving more than 160 hospitals. In that time, [✂]; even more noteworthy is the coincident improvement in various patient care quality measures (e.g. core measures, falls) and human resource measures (e.g. engagement, turnover, scheduling quality) as emphasis has increased in these areas in recent years.

5.346 HCA management engineers are acknowledged experts and regular presenters on such topics, as well as process improvement, at their professional societies (Institute of Industrial Engineers/Society for Health Systems; and Healthcare Information and Management Systems Society).

5.347 The success of HCA's systems is demonstrated through its US subsidiary organisation, Parallon, which is successfully marketing, installing and maintaining these productivity and workforce management tools to/in other healthcare organisations. HCA (UK) has benefited enormously from these staff planning systems and know-how.

Conclusions

5.348 In its analysis of market share, the CC already recognises that HCA's business model is different to its competitors':

"*There are other factors that may limit substitutability between HCA hospitals and its rivals, for example brand, reputation and patient perceptions. These may limit patient (and PMIs which represent patients) switching to (or searching for) alternative hospitals*".[376]

5.349 The astuteness of the London[377] and international patient is sufficient to demonstrate that this is not due to superficial factors such as brand and perceptions, but due to underlying factors of clinical back-up and quality, innovation, investment and efficiency.

5.350 It is this focus on clinical acuity and back-up, innovation, investment and efficiency that are the real reasons for HCA's profitability – and not ineffective competition.

[376] CC, PFs, para. 6.136.

[377] The CC patient survey also showed that patients in London were more likely to have engaged in some research ahead of their treatment. Patients in London were more likely than average to have looked up any information online (63% compared with 47% on average), and in particular more likely to have looked up the web- sites of private consultants (41% compared with 25% on average), of private hospitals/PPUs (36% compared with 24% on average) and other websites (e.g. Google search) (20% compared with 12% on average). (CC, PFs, A6(10), Para. 13).

6. APPENDIX 6: HCA'S INVESTMENT IN INNOVATIVE PRACTICE, TECHNIQUES AND TREATMENTS

6.1 Quality of care is the cornerstone of HCA's healthcare offering. As a term, it encapsulates a variety of factors, such as the quality of facilities, patient services and the calibre of clinical support teams. Quality is also determined by the range and effectiveness of the hospital's clinical practices, techniques and treatments. This can take the form of:

- **A broader and more effective range of treatments**: This technology provides the consultant with a better "toolkit" to effectively treat a patient. For example, it may be the case that only a particular treatment would be effective (or more effective) in treating a specific condition, taking into account the patient's specific characteristics. Alternatively, a specific treatment choice may be more appropriate as it means the patient would spend less time in hospital or because it would minimise the invasiveness of the intervention, reduce the risk of infection, or cause fewer / no adverse side-effects The broader the range of treatments, the greater the consultant's ability to shape the correct care pathway to each patient's specific needs.

- **Better diagnostic technology**: This technology optimises the consultant's ability to diagnose the patient's condition (for example, through more sophisticated imaging) and help determine the correct clinical intervention (if any).

- **Clinical support technology**: This technology enables the consultant (or clinical staff) to deliver care more efficiently to the patient. For example, this might be achieved by providing technology that offers consultants remote, real-time access to the patient's current status as well as instant access to all diagnostic and test results. Another example might be technology that enables nursing staff to better monitor the patient's condition and accurately record the patient's drug intake.

6.2 Since its entry into the UK private healthcare sector, HCA has introduced a wide range of clinical advancements in its hospitals. HCA has been, and continues to be, a pioneer of new technology, techniques and treatments across different specialisms and ranging from incremental improvements to industry breakthroughs. In this Appendix, HCA describes some of the innovations it has brought to the UK private healthcare industry. These innovations help to illustrate how HCA competes with other hospital operators on improving quality of care and, as a result, generate positive outcomes for patients.

HCA-wide innovations	
Digital mammography	HCA was the first provider to implement digital mammography. This delivers rapid, high resolution digital images which can be manipulated and enhanced to ensure the clearest quality image is produced to support breast cancer detection. It also enables remote review of images.
Extremity MRI	HCA offered a new type of scan which uses a strong magnetic field and radio waves to create high quality computer images of tissues, organs and structures inside the body.
Fiducial markers	HCA developed markers to be placed on / in the patient's body to help guide radiotherapy treatment to the target regions, increasing accuracy and reducing exposure to non-target regions.
HCA Cancer Networks	HCA's Cancer Network acts to co-ordinate the delivery of cancer care across the organisation ensuring seamless care provision between facilities whilst setting and monitoring key quality and outcome measures. It is the first Cancer Network to be accredited by CHKS. Cancer requires a complex treatment pathway involving diagnostics, surgery, chemotherapy, radiotherapy, supportive and palliative care. The complex nature of the disease and its treatment means the best results are obtained by highly integrated clinical teams.
ICU IT system	HCA developed a system to support the workforce in monitoring the vital signs of patients in intensive care and making personnel aware of any unexpected changes.
Physician and patient portals	HCA introduced technology to allow physicians to securely access patient records remotely, to keep abreast of patient's progress when not onsite.
Prostate mapping with a 3T MRI	In 2012 HCA was the first private hospital to participate in prostate scanning with a powerful MRI machine (3T vs. 1.5T), providing a non-invasive way to assess prostate cancer.
Provenge	HCA was the first provider to implement the use of Provenge, which is a new immunotherapy for prostate cancer.
Provision of centralised laboratories	HCA developed a broad range of high specification laboratories, offering market-leading turnaround times and test accuracy.
Quantra breast density reader	HCA provides a computed breast density figure for all women having a mammogram, enabling identification of the heightened risk and increased difficulty of detection associated with high breast density.
SuperDimension	HCA provided electromagnetic navigation which guides bronchoscopy to the relevant area, providing minimal invasive access to lesions deep in the lungs as well as mediastinal lymph nodes.

HCA-wide innovations	
Video-Assisted Thoracic Surgery (VATS)	HCA offered surgery using small cameras providing a live feed from within the patient's body, enabling the surgeon to adopt a less invasive approach to treating the patient.
Virtual colonoscopy	HCA introduced a new imaging technique, which is used as an alternative to full colonoscopy. This technique carries a lower risk to the patient and is less invasive than a full colonoscopy. The patient's colon is inflated and imaged using a CT scanner. Computers are then used to construct a representation of the patient's colon for inspection.

Harley Street Clinic (HSC) innovations	
Calypso	HSC have Calypso tracking (http://www.calypsomedical.com). This involves implanting marker beacons into the prostate gland so that any movement can be tracked during treatment. The prostate can move according to bladder and/or rectal fullness, bowel gas, bowel motion. This technique allows radiotherapists to track the prostate movement and terminate the beam if the prostate moves out of the radiation beam. This allows HSC to treat smaller volumes, reducing side effects for patients.
CyberKnife	In 2007 HSC opened the UK's first revolutionary CyberKnife robotic radiosurgery machine. This is a compact linear accelerator mounted on a robotic arm designed to deliver precision treatment of tumours anywhere in the body, including areas not possible to treat with more established radiotherapy.
Deep Inspiration Breath Hold Radiotherapy	HSC offered a technique whereby radiotherapy treatment is given when the patient breathes in and holds their breath. The action of breathing in moves the breast away from the heart and reduces the radiation dose. This reduces the risks to the patient of heart damage and late complications. This is not widely carried out in the UK. Since introducing the technique in 2011, it has treated over 100 patients, and the technique is being requested by doctors more frequently.
Gamma Knife	In 2005 HSC introduced an advanced radiosurgical system which is used to treat patients with certain brain conditions. This technique was first offered by the Bupa Cromwell hospital in London, and developed by HCA in response to Bupa as a competitor. It may be used as a replacement for conventional neurosurgery, or it may be effective in situations where there is no conventional surgical alternative available. The London Gamma Knife Centre at Barts is the first facility when that the private sector and the NHS have partnered to offer this important radiosurgical treatment to patients from all sectors.
GUCH service	HSC set up this service in February 2011 which links in with the Somerville Association. The service works with its Paediatric Cardiac Service and cares for cardiac patients from the age of 16.
Image Modulated Radiotherapy (IMRT), Image Guided Radiotherapy (IGRT) and Rapid Arc	HSC launched new radiotherapy systems which, using a tumour mapping system, target tumours with a greater degree of accuracy and far less damage to surrounding healthy tissue than linear accelerators without these systems. HSC's figures are well in excess of the national figures. HSC uses a technique called RapidArc to deliver IMRT to the patient.
Paediatric bone marrow transplant (BMT)	In February 2013 HSC became the first and only private hospital to offer specialist haemotology care in addition to BMT care.

Harley Street Clinic (HSC) innovations	
Paediatric cardiac	HSC were one of the first private healthcare facilities to offer cardiac surgery to children from birth. It currently sees its patients return in their adult years and is now developing a "grown up" congenital heart service to accommodate these patients. The service also links in with our GUCH service once the patients reach 16 years of age.
Paediatric Intensive Care Unit (PICU)	HSC has the largest private PICU in Europe. In 2010 HSC's PICU became the first private unit to participate in data collection for PicaNet (Paediatric Intensive Care Audit Network). The data is used to identify best practice, monitor supply and demand and review treatment outcomes. PicaNet also studies the epidemiology of critical illness in children.
Renal denervation	HSC introduced a minimally invasive technique involving the ablation of renal blood vessels to treat refractory hypertension.
Watchman device	HSC was the first private hospital operator to launch a new, minimally invasive technique involving the insertion of a "Left Atrial Appendage Closure Device" in patients with atrial fibrillation. This device filters any blood clots which may form as a result of disturbed blood flow in the left atrium, reducing the risk of stroke.

London Bridge Hospital (LBH) innovations	
Accredited as a training unit for perfusionists	LBH is the only perfusion department in the UK private sector accredited as a training unit for perfusionists by the College of Clinical Perfusion Scientists of Great Britain and Ireland.
Anti-Platelet Therapy program	LBH were the first (and still only) private hospital to offer an individualised Anti-Platelet Therapy program using a Multiplate Platelet Function Analyser. All cardiology and cardiac surgical patients on aspirin, Clopidogrel, Prasugrel or Ticagrelor are assessed to ensure the drugs are working effectively.
Bio-coated heart lung machine circuit and centrifugal blood pump technology	LBH is the only private hospital to routinely use a bio-coated heart lung machine circuit and centrifugal blood pump technology to limit blood trauma during cardiac surgery.
Blood conserving and recycling	LBH was the first private hospital in the UK to routinely use cell salvage (collection, processing and returning a patient's own blood) during all surgical procedures where bleeding is a risk. This has led to a significant reduction in transfusions.
Cardiothoracic data	LBH was the first and only private hospital to publish cardiothoracic data allowing HCA to be compared to the NHS and overseas providers.
Disordered Breathing Clinic	LBH was the first private clinic dedicated to the treatment of breathing disorders.
Dual ablation procedure for arrhythmia	LBH performed the world's first dual ablation Arrhythmia procedure. It is the first time this new dual procedure has been performed worldwide. It involves a normal radio frequency ablation operation combined with the cryo ablation procedure which increases the effectiveness of the treatment.
EBUS Lung Cancer Diagnosis	LBH offered Endobronchial Ultrasound (EBUS) which is a minimally invasive approach to sampling lymph nodes which are difficult to access or central masses in the chest. Lymph nodes as small as five millimetres can be sampled and the technique has broader applications. These include the diagnosis and staging of cancers of the lung and other cancers that are suspected of spreading to the lymph nodes in the chest.
Hansen Robot™	LBH was the first private hospital to use the Hansen Robot for ablation. Robotic ablation is catheter ablation of cardiac arrhythmias performed by an electrophysiologist using a robotic system. The robotic system consists of a robotic sheath that manipulates cardiac catheters, operated remotely at a nearby control station.
Hybrid cardiovascular laboratory	LBH developed the first hybrid cardiovascular laboratory in the private sector. The hybrid lab is a facility which combines the powerful imaging equipment of the angiography suite with the specific environment of the operating theatre.
Hybrid cath labs	LBH offered transcatheter aortic valve implantation (TAVI) procedures to be conducted in a cath lab setting.
Intra-operative MRI for spinal	LBH launched intra-operative magnetic resonance imaging (iMRI). This is an operating theatre configuration where surgeons can image the patient via an MRI scanner while the patient is undergoing surgery. Although commonly used for brain procedures, intra-operative MRI has been pioneered by LBHfor spinal procedures.

London Bridge Hospital (LBH) innovations	
Live related liver transplants	At the London Liver Centre, LBH offers living donor liver transplantation for patients who have no access or entitlement to cadaveric organs or to those patients for whom liver resection or chemotherapy is not an option.
Live related renal transplants	LBH was the first private facility to offer kidney transplant from a live donor.
Lupus centre	LBH provided the first specialist lupus centre in the private sector.
PLAC (LpPLA2) test	LBH was the first hospital in the UK to offer the PLAC (LpPLA2) test to assess an individual patient's risk of stroke or heart attack.
POTs Clinics	LBH provided the first clinics in the UK private sector for syncope Clinic-Postural Orthostatic Tachycardia (POTs) patients.
Private EBUS	LBH was the first to introduce endo-bronchial ultrasound technology to identify and sample suspected cancers.
Renal Displays unit	LBH was the first private facility to offer dialysis which delivers care to both private and NHS patients.
Spartan Rx	LBH was the first hospital in the world to use the Spartan Rx (Point of Care) DNA analyser for Individualised Anti-Platelet Therapy.
Super low-dose CT	In 2012 LBH offered a super low-dose CT scanner, an imaging system that drastically reduces the radiation dose to patients and is especially beneficial to patients who may require multiple imaging tests, such as cancer patients.
TAVI 27	LBH was the first private facility to offer TAVI, closely followed by the Harley Street Clinic.
Theatre based Coagulation and Haematology laboratory	LBH has the most comprehensive theatre based Coagulation and Haematology laboratory to diagnose clotting abnormalities and prevent bleeding and transfusions.
Vivostat Autologous Fibrin Sealant	LBH was the first private hospital in the UK to use the Vivostat Autologous Fibrin Sealant (tissue "glue" prepared from a sample of patient blood at the time of surgery) to prevent bleeding during surgery. This forms part of LBH's Total Blood Management program along with its coagulation laboratory and cell salvage procedure.

London Oncology Clinic (LOC) innovations	
Audit and outcome analysis (Mosaic)	LOC developed an entirely auditable electronic record which allows for visibility of abnormal doctor behaviour – alerting lead doctors to deviations from the norm, and therefore leading to intervention.
Integrated electronic notes	LOC developed integrated electronic notes allowing access to the patient's notes from their entire cancer pathway, accessible anywhere via a secure portal.
Protocol driven electronic prescribing	LOC developed world leading use of protocol driving software that means doctors cannot deviate from accepted best practice behaviour in the administration of chemotherapy.
Survivorship programme	LOC developed the first private survivorship programme.

NHS Ventures (NHSV) innovations	
Bone marrow transplants	NHSV launched the first private patient facility to offer bone marrow transplants.
TIL	NHSV developed a clinical team to deliver the specialist care that is involved in the complex "TIL Therapy" process. This process involves chemotherapy cells grown in the laboratory and interleukin-2.

Princess Grace Hospital (PG) innovations	
24 hour on site ICU consultant cover	Developed by PG in 2008 to increase patient safety.
Balloon kyphoplasty	In 2007 PG was the first private hospital to offer this procedure.
Breast intra operative radiation therapy (IORT)	From October 2012, the PG became the first private hospital in the UK to offer IORT, a pioneering form of radiotherapy that can be delivered in a single session, rather than over several weeks.
Complex MRI	In 2013 PG was the first private centre to develop complex MRI programs to look at the diffusion of nutrients into the inter-spinal disc.
Consultant responsible for pre-admission services	Developed by PG in 2011 to increase efficiency and ensure correct treatment of patients.
da Vinci robotic surgery	In 2012 a computer-enhanced robotic surgery system was first brought to the UK at the Princess Grace which enables a surgeon to perform minimally invasive work in tricky or delicate areas whilst having a clearer 3D view of the nerves, blood vessels and muscles. This led to the first liver re-section and Whipples and the first single access cholscystectomy in the UK.
Dedicated self-pay team	Developed by PG in 2013 to assist patients and allay their concerns.
Endoscopic spinal surgery	PG offered endoscopic spinal surgery in 2012 which enables patients to have a reduced recovery period.
Focal therapy including HIFU and RFA	In 2005 PG launched less invasive treatment options for prostate cancer, using High Intensity Focused Ultrasound (HIFU) or Radio-Frequency Ablation (RFA) to destroy tumours. At the time, it was the first of its kind for private patients.
HiFu	In 2005 PG offered high frequency ablation (Hi Fu) for prostate cancer.
IORT	In 2012 PG launched intra-operative radiotherapy. This allows the patient to have radiotherapy at the time of surgery, negating the need for numerous visits over the course of treatment.
ISEH	Introduced in 2013 by PG to provide access to top consultants for elite and weekend warrior sportsmen. It is a unique partnership between NHS, BOA, ISEH & HCA. It assists the NHS and contributes to research.
London Breast Institute	Introduced by PG in 2008 to give patients access to specialist services from leading physicians. The institute publishes and contributes to a great deal of international research.

Princess Grace Hospital (PG) innovations	
Metal on metal hip replacement trial	Developed by PG in 2013, this trial looks at degradation of metal on metal hip replacements. It operates across multiple sites including London Bridge.
Modic antibiotic spinal therapy	In 2013 PG were first in the UK to carry out Modic antibiotic spinal therapy, which involves interpretation of MRIs at different modalities.
NanoKnife	In 2012 PG launched a pioneering cancer treatment modality for inoperable tumours in the lungs, kidney, liver, breast, prostate or pancreas.
Patient ID card	Developed by PG in 2013. Patients are given a card with a unique number used across the hospital. This eliminates duplicate registration and possible issues with care/treatment.
Robotic surgery	In 2012 PG offered robotic surgery (prostate, kidney, hepatobiliary (HPB), colorectal and gynae) – within its planned Robotic Centre of Excellence. Robotic work allows for some surgeries to take place that would otherwise be inoperable (HPB in particular).
Schrill in endoscopic spinal surgery	In 2013 PG were first in the UK to use the schrill in endoscopic spinal surgery.
SmartPil	In 2010 PG was the first in Europe to offer an ingestible capsule that measures PH, pressure and temperature through a wireless connection monitor.
Surgiquest	In 2013 PG was the first private hospital in the UK to use a laparoscopic port that maintains an airtight pneumothorax, improving visual field.
Trimano	In 2013 PG was the first private hospital in the UK to use this position guided extension, replacing the surgical assistant for shoulder surgery.
Urgent Care Centre	In 2005 PG introduced a care centre, helping to reduce NHS A&E pressures and providing a wide range of specialty cover.
Vacuum assisted breast biopsy	In 2006 PG introduced a new technique for the removal of breast lumps quickly and without a surgical operation, using the "ENCOR breast biopsy system".

Portland Hospital (PH) innovations	
24/7 access to private paediatrician for urgent admissions	Introduced by PH in 2010 and includes both outpatient access and onward admission to hospital if required.
Accumulation and investment in sub-specialised and hard to recruit staff – e.g. Clinical Nurse Specialists (CNS) and Paediatric Intensive Care Unit (PICU) nurses.	PH currently has the largest and most comprehensive private paediatric service in the UK.
Cochlear implant program	In 1997 PH offered a full paediatric and adult cochlear implant program.
Comprehensive multidisciplinary private birth mark service	In 2011 PH developed the only comprehensive multidisciplinary private birthmark service involving dermatologists, interventional radiologists and plastic surgeons.
Neurosurgery/ craniofacial surgical groups	In 2011 PH launched a comprehensive neurosurgical and craniofacial service.
Offers the only private neonatal unit in the UK	In 1983 PH opened a seven bed neonatal unit staffed by consultant neonatologists.
Paediatric Intensive Care Unit (PICU)	In November 2011 PH developed a 10 bed PICU.
Private Food allergy and challenge services	Introduced by PH in 2013, it is the only facility to offer a full allergy service provision.
Private maternity unit	In 1983 PH developed the UK's only full private maternity unit, which has approximately 2,000 deliveries per annum and is one of the most renowned facilities in the world.
Private paediatric acute neuro-rehabilitation unit	In 2009 PH developed a nine-bed unit and became the only private hospital in the UK to offer a paediatric acute neuro-rehabilitation unit.
Resident obstetric anaesthetist	Introduced by PH to enhance safety for the patient. PH was the first hospital in the country to do so.

Portland Hospital (PH) innovations	
State of art CT scanner for children	PH developed anaesthetised and non-anaesthetised scans in November 2012.

SCRI innovations	
Genetic profiling laboratory	Developed by SCRI in 2013 this new laboratory provides the opportunity for molecular profiling of a patient's tumours to become a routine part of the diagnosis of their cancer. It ensures that doctors can identify different treatments based on the genetic make-up of the tumour and what drugs it is likely to respond to.
In-man clinical trials for privately funded patients	Developed in 2010, SCRI is the only private facility in the UK to run first-in-man clinical trials. It is part of a much larger US infrastructure.

Wellington Hospital (WH) innovations	
Acute stroke unit costing	WH is soon to begin building the first UK private sector acute stroke unit at a cost of [✂]. There is no other operator currently offering this type of service.
Closure of hole in the heart using minimal invasive procedure	WH introduced a procedure involving closure of a hole in the heart. It is a minimally invasive procedure employing memory metal devices. Hole in the heart repairs previously needed major open heart surgery with three months off work, were high cost and involved risky anaesthetics. London Bridge and the Wellington were the first hospitals in the UK private sector to introduce this procedure which takes an hour and the patient goes home the same day.
Complex Electrophysiology (EP) ablations	WH offers EP ablations done in the cath lab. All three cardiac sites perform more complex work than available from the NHS.
Counter pulsation treatments	WH developed counter pulsation treatments for end stage cardiac failure. The nearest centre is in the US, with WH the first and currently the only centre in the UK.
Medical admissions unit	WH was the first private facility to be able to urgently admit patients with considerable complications such as ventricular failure, pneumonia and COPD. These patients would otherwise be unable to be admittedly privately.
Neuro endocrine service for complex tumours	WH was the first hospital in the private sector to develop a neuro endocrine service for the treatment of complex tumour. The first, overall, was the Royal Free Hospital, where the service was developed. Cases also come from the US where the use of complex compounds is not allowed.
Neuro rehab robots	WH was the first private hospital to introduce neurorehabilitation robots.
Neurorehab unit	Developed in 2006, WH was the first private hospital to introduce a dedicated neurorehabilitation facility.
Stem cells to grow ligament tissue	WH was the first in the UK private sector to use stem cells for the growth of ligament tissue in orthopaedic joint and tissue repair.

7. APPENDIX 7: HCA BUSINESS CASES AND THEIR RATIONALE

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