# CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive summary</td>
<td>1</td>
</tr>
<tr>
<td>1  Introduction</td>
<td>9</td>
</tr>
<tr>
<td>2  Markets for prescription pharmaceuticals in the NHS</td>
<td>12</td>
</tr>
<tr>
<td>3  Drug prices and global investment incentives</td>
<td>37</td>
</tr>
<tr>
<td>4  Evaluation of current pricing and reimbursement arrangements</td>
<td>54</td>
</tr>
<tr>
<td>5  Options for reform</td>
<td>69</td>
</tr>
<tr>
<td>6  Recommendations and institutional framework</td>
<td>104</td>
</tr>
</tbody>
</table>
EXECUTIVE SUMMARY

Key recommendations

• We recommend that Government reform the PPRS, replacing current profit and price controls with a value-based approach to pricing, which would ensure the price of drugs reflect their clinical and therapeutic value to patients and the broader NHS.

• We believe this would provide major benefits to patients and innovative companies in the short and long term:
  – value for money for the NHS: we have identified hundreds of millions of pounds of expenditure per year that could be used more cost effectively under value-based pricing, allowing patients greater access to drugs and other healthcare benefits they are currently being denied. In short, the same level of expenditure could be used to produce greater benefits for patients.
  – better incentives to invest: more value-reflective prices would give companies much stronger incentives to invest in the drugs that are most beneficial to society, particularly in areas of unmet patient need. Given the international importance of UK prices, these benefits would be felt not just in the UK, but globally.
  – a stable, sustainable system: these reforms would improve stability for Government and industry in the long run, by avoiding reliance on increasingly arbitrary profit and price controls and ensuring instead that future pricing decisions are based on an informed, rational debate about how to make the best use of available NHS resources.

• International experience shows that value-based pricing can work well in countries that have fewer resources than we enjoy in the UK but companies have highlighted key issues that need to be addressed in ensuring effective implementation. We believe we have met these concerns in developing options for reform that will provide a credible, practical pricing regime for the long term.

The Role of the PPRS

Prescription medicines help improve the lives of millions of patients in the UK. New breakthrough drugs are brought to market every year, such as those recently developed to treat various forms of cancer and severe forms of disabling arthritis. These join more established medicines such as aspirin, which still saves many thousands of lives per year in its applications in cardiovascular medicine and against life-threatening inflammations.

The NHS spends about £11 billion a year on these treatments, £8 billion of which is on branded drugs. This is a study of the Pharmaceutical Price Regulation Scheme (PPRS), one of the main instruments employed by the UK Health Departments to control NHS expenditure on these branded drugs.

The aims of the scheme are to secure value for money for the NHS while providing pharmaceutical companies with the right incentives to invest in new and useful drugs for the future. The remit of this study, launched by the OFT in September 2005, is to assess whether the PPRS is effective in meeting its high-level objectives, or whether there is a case for reform.

The workings of the scheme are complex, but at a broad level it comprises two main components:

• profit controls, which set a maximum level for the profits that a company may earn from the supply of branded drugs to the NHS. Exceeding this level will require a repayment of excess profits to DH. The profit control also enables companies to increase prices if their profits fall below a given minimum.
• **price controls**, which give companies freedom to set the initial price of new active substances but impose restrictions on subsequent price increases. They also comprise **price cuts**, which are agreed at the time of scheme renegotiations. A seven per cent cut was imposed as part of the negotiation of the current PPRS scheme beginning in 2005. Companies are given some flexibility in deciding which products to target in cutting prices, a system known as price modulation.

A major reason for the existence of a UK-wide drug pricing scheme is the difficulty the NHS has in ensuring drugs are prescribed in a way that delivers value for money. Informational and incentive problems result in a situation in which prescribers are often not sensitive to or even aware of the prices of the drugs they prescribe. This is particularly the case in primary care, which accounts for some 75 per cent of pharmaceutical expenditure in the NHS. Evidence we have collected from a survey of 1000 GPs suggests they have weak knowledge of the prices of some of the most widely-prescribed drugs in the UK.

Moreover, under current arrangements, there are high levels of prescribing for some products that cost much more than available substitutes but deliver very similar benefits to patients. This raises a major question as to whether value for money is being secured. Neither are patients price sensitive: they contribute through prescription charges to less than five per cent of expenditure on prescription pharmaceuticals – a lower rate than in almost all other countries in the world.

These demand side problems provide a compelling argument for some form of pricing scheme. In seeking to address them, the PPRS works in conjunction with a wide range of mechanisms and institutions designed to encourage cost effective prescribing behaviour at a local and national level. Notable among these are the bodies charged with evaluating the cost effectiveness of drugs and other medical interventions in the UK: the National Institute for Health and Clinical Excellence (NICE), which operates in England and Wales; the Scottish Medicines Consortium (SMC), which operates in Scotland; and the All Wales Medicines Strategy Group (AWMSG), which operates in Wales.

Therefore, despite its name, we do not consider the scheme to be a regulatory mechanism in the true sense of the word. It is best thought of as an attempt to exercise buyer power in the purchase of prescription pharmaceuticals by the NHS across the UK, to meet the interests of patients both in the short run (through helping to maximise benefits from available resources) and the long run (through the continued supply of new and useful drugs in the future).

**Assessment of the Scheme**

The scheme has been in place for almost fifty years. Many companies view it positively compared with alternatives that exist in a number of countries. In particular, they value the relative stability it affords them, since it insulates them to a degree from opportunistic behaviour during the five year term of the scheme. This stability has been reduced in their eyes, however, by the arbitrary nature and increasing size of the price cuts implemented during PPRS negotiations. The scheme also allows drugs to come onto the UK market rapidly without the need for lengthy up front price negotiations. Again, this is offset, however, by the fact that the subsequent uptake of these drugs by prescribers is low by international standards.

For the NHS, PPRS price cuts deliver savings in primary care. These amounted to about £450 million in the UK in 2005. The effect of the cut reduces over time as drugs that have been subject to a cut are replaced by new drugs at uncontrolled prices. The effect of the cut on hospital prices is less clear – as the PPRS affects list prices rather than the transaction prices at which hospitals purchase – and several trusts have given us evidence showing the 2005 cut did not generate savings for them.
The scheme is also light on direct administration costs for the public purse. The PPRS team at the Department of Health (DH) is highly competent and professional, and operates a very complex scheme with minimal resources.

**Profit and price controls do not reflect the value of drugs**

However, we have an overriding concern with the scheme as it is currently designed: neither the profit cap nor the price cut helps secure prices that reflect the therapeutic value of the drugs companies are supplying to the NHS. For a scheme that sets out to deliver value for money for the NHS and give companies the right incentives to invest, we consider this to be a major shortcoming, particularly in view of the demand side problems we have identified in the rest of the NHS.

**Profit cap**

It is clearly right that the NHS should seek to constrain what it spends on drugs, but we believe regulating profits is a very indirect means of doing so, and one that is ill-suited to an innovative sector such as pharmaceuticals. The possibility of earning high (or low) profits provides a strong incentive to companies to produce valuable drugs for patients. Imposing maximum and minimum allowed levels of profits in a way that takes no account of the value of drugs produced by a firm dulls those incentives. Our analysis has also identified a number of major practical difficulties in making meaningful profitability assessments in the pharmaceutical sector – not least the fact that companies have an increasingly global cost base and a high level of intangible capital, which is only indirectly recognised through the scheme.

We have found that, perhaps as a result of these sorts of arguments, there has been a significant reduction in the importance of profit controls within the PPRS in recent years. Cost allowances have been made more generous and the band between maximum and minimum allowed profit levels has been widened. As a result, profit repayments in the 1999 – 2004 Scheme were negligible, with repayments representing only about 0.01 per cent of company PPRS revenues over the period. Profit controls are therefore not a binding constraint for most companies, although some small UK-based companies with high levels of R&D expenditure may potentially be adversely affected.

**Price cuts**

The one-off price cuts imposed across a company’s products similarly take no account of the value of these products to patients. Given freedom of pricing up front and demand side problems, one supplier may be producing drugs that are particularly cost effective while another may not. Under the PPRS both have to reduce their average prices by the same percentage. Again, this is not consistent with value for money or good investment incentives. Price cuts may also affect smaller companies to a greater extent as they are less able to spread the effects of the cut over a broad portfolio of drugs.

The overall level of the cut is unrelated to objective criteria. Since companies have freedom to set prices initially, the more price cuts become a regular feature of the PPRS, the more firms are likely to anticipate them in setting initial prices (at the optimal price plus anticipated percentage price cut) particularly towards the end of a given PPRS period. If this continues, price setting risks becoming a strategic game in which firms attempt to guess the level of forthcoming price cuts and DH attempts to second guess this effect in setting the level of price cuts. We do not consider this to be a sustainable model of pricing for the future.
Outcomes

Demand side problems in the broader NHS lead to prescribing that in some major cases is not cost effective. In our view, the fact that existing PPRS controls do not take account of the therapeutic value of drugs significantly undermines the extent to which they can address these problems and secure value for money for the NHS.

Under current pricing arrangements, drugs that have very similar clinical effects can have widely divergent prices – we have observed price differences of 500% or more for very close substitutes. Reviewing some major drug categories on an indicative basis we identified over £500 million of expenditure in 2005 that could have been put to more cost effective uses. For one drug alone we estimate that the use of more value-reflective prices could potentially have saved £350 million in that year for use on other drugs and treatments. For off-patent brands with chemically identical generics some £65 million could have been saved.

Effect on patients

This has major effects on patients. Where prices are out of line with value, the NHS is not making the best use of available resources to improve patient health. The effects of this are felt by patients through reduced access to both drugs and other forms of healthcare. For example, if too much is spent on an existing drug, Primary Care Organisations may have to balance their budgets by restricting access to new, innovative drugs or by reducing elective care procured in hospitals for a given period.

These trade offs are shown most clearly in the work of NICE, SMC and AWMSG. NICE, for example, has recently rejected a number of new cancer drugs partly on the basis of cost to the NHS. These difficult choices are inevitable given the limited resources the NHS has at its disposal and we welcome the creation of NICE, SMC and AWMSG as important moves towards a fairer and more efficient system of deciding how to use NHS resources. But where access is restricted on cost effectiveness grounds, it is vitally important that all drugs – old and new – are assessed on the same basis. This does not happen across the board under current arrangements because of the limited remits these bodies have been given. To restrict access to new treatments while ignoring inefficiencies in current expenditure is not an efficient use of resources. Nor is it in the interests of patients.

Effect on investment

When the prices of medicines are inefficient this will also distort the investment incentives of firms. Specifically, companies will not be given the right incentives to invest in drugs that are most beneficial to society, including areas of unmet clinical demand. We have found that UK prices are likely to have a significant effect on incentives to invest since, although UK revenues represent only about four per cent of global demand, other countries set many of their prices with reference to those in the UK. Together these countries account for around 25 per cent of global demand. Furthermore, our international research has confirmed that UK prices are used in implicit price comparisons (that is, as part of company / country negotiations) even where they are not used in formal international reference price schemes. More value-reflective prices in the UK could therefore bring major gains over time as they drive investment in areas of clinical need.

Our focus in this study is not on whether aggregate expenditure on drugs in the UK is too high – this is a matter for central Government. Rather we believe that the NHS could make better use of the resources it has – the efficiency savings we have identified could be used to improve access to and uptake of innovative and effective medicines that will have a significant effect on patients’ lives. We note that DH analysis suggests that overall prices in
the UK have historically been higher than the rest of Europe, but that the situation changed after the 2005 price cut. UK prices in that year were not the highest in Europe but in the upper half of the range. In general, we would expect the effect of the price cut to be strongest in the year in which it is introduced. Therefore it is not clear whether this is a temporary or longer term realignment of prices. We are aware that price comparisons are sensitive to a range of factors, such as the choice of comparator products and exchange rates. They also ignore the effect of rebates between companies and payers, which are particularly important in the higher priced countries such as the US and Germany and therefore will tend to overstate prices in those countries with reference to those in the UK.

Several stakeholders have expressed to us the view that the scheme should be considered as an instrument of industrial policy (that is, as a means of attracting R&D investment into the UK). We have found that the scheme itself does not provide explicit incentives for companies to invest in the UK (the R&D allowances under the scheme apply to R&D wherever in the world it is undertaken, not just to R&D incurred in the UK). Furthermore, the scheme could not be revised in the future to provide such explicit incentives. Any attempt to offer firms better prices if they located in the UK would almost certainly fall foul of EU legislation on state aid and the free movement of goods. The Government has much more effective instruments at its disposal for attracting investment into the UK, such as investing in the scientific skill base or improving the environment for clinical trials. Examples of initiatives that do this, such as the creation of the UK Clinical Research Collaboration, are to be welcomed.

Options for reform

We have considered a number of options for reform in the course of the study. Some involve incremental changes to existing instruments, such as amendments to the profit cap to address the potential disadvantage to which small firms are put under current arrangements. This could include smoothing the assessment of profitability over time or allowing an R&D allowance that is more commensurate with small companies’ global R&D / sales ratios.

However, while such measures may bring small improvements, they would not address the fundamental concerns we have with existing arrangements. To ensure value for money from NHS expenditure and give good, stable investment incentives to companies in the long run, there is a compelling case for reform of the scheme towards a value-based pricing system that would relate the prices of products to their clinical value relative to existing treatments.

For on-patent brands, this report sets out in detail the key principles that we think should guide reform and the many different design options that need to be considered. But it is possible, at a high level, to identify two broad options.

The first option – which we have called ex post value-based pricing – would involve retaining up front freedom of pricing for companies for new active substances but would replace company-wide profit controls and price cuts with a series of ex post reviews of the cost effectiveness of individual drugs or drug classes. These reviews would set a maximum price for a product in accordance with the clinical benefits it delivers relative to an appropriate comparator. The timing of reviews would be designed to coincide with major events (such as new drugs entering the market, comparators going off patent, or the results of Phase 4 trials providing new clinical information). The timing of reviews and principles to inform them could be set out in a PPRS-style framework agreement between industry and government.

The second option – ex ante value-based pricing – would again replace PPRS profit and price controls. In addition to the ex post reviews for existing drugs, it would involve a fast track ex ante assessment of a new drug’s cost effectiveness (starting during the licensing
Where there is sufficient cost effectiveness data to make a judgement, a rapid decision could be made on the appropriate maximum price (again, reflecting the benefits of a product relative to those of an appropriate comparator) and a decision to reimburse or not.

Where data at the time of launch is insufficient to take an informed view on cost effectiveness, then, in a limited number of cases, a risk sharing approach could be adopted. This would require the company and payer to agree a contract in which the drug is reimbursed, contingent on claims of clinical effectiveness being realised in practice. This would be assessed through information on the use of the drug in clinical practice. If expected outcomes are not realised, prices would be changed and/or repayments made. Risk sharing arrangements could in principle be particularly relevant for the treatment of chronic (as opposed to acute) conditions, where final clinical outcomes may only become clear after several years of use. However, challenges for implementation remain and risk sharing would be the exception rather than the norm under an ex ante approach to pricing.

The ex post approach is closer to current arrangements and the majority of companies we spoke to suggested it would be preferable to the ex ante pricing model, for fear that the latter would lead to the protracted negotiations and delays that are seen in some countries. We understand these concerns but we do not think that delays are inevitable. Almost all countries in the world with the exception of the UK and Germany involve systems in which payers negotiate prices up front before deciding to reimburse a drug. The US – often characterised as an ‘industry-friendly market’ – is no exception to this. In the UK the experience of SMC and NICE’s new STA (Single Technology Appraisal) assessment process suggests that, with appropriate data, a rapid assessment can be made of a drug’s cost effectiveness. Delays in some other countries tend, rather, to be the result of the need to make a “once and for all” decision on price and reimbursement, which makes negotiations protracted and contentious. Under the ex ante model we have set out, the facility to assess effectiveness further down the line should allow a quick view to be taken up front.

Furthermore, assessing cost effectiveness up front can have beneficial effects in terms of uptake – since some prescribers can feel more confident using a drug if they know it has been assessed as being cost effective. This is particularly a phenomenon of secondary care and it is noteworthy that one company producing drugs primarily for secondary care expressed a preference for ex ante value-based pricing on the basis that it would help them deal with the so-called problem of “NICE blight” (low uptake in the absence of a NICE assessment).

Under either approach, we feel much could be achieved by allowing for more flexible price structures than at present such as price volume agreements and rebate systems. This would be particularly useful for drugs for which cost effectiveness differs markedly by indication and patient subgroup. Where this is the case, a higher price could apply for a particular volume of prescriptions, reflecting the patient subgroup for which the drug will be particularly effective, and a lower price for volumes in excess of that. The same outcome could be achieved through rebates between companies and payers and in practice, we believe this may be the more practical solution.

Allowing for a more flexible pricing structure would help address the concern that, under current pricing arrangements, companies have incentives to incur marketing expenditure in an attempt to increase volumes prescribed beyond those for which the drug may be cost effective. Changes to the price structure would therefore help ensure the incentives of firms are much more closely aligned with those of the NHS. Companies in turn could reallocate the resources saved towards demonstrating the cost effectiveness of the drug with the relevant pricing authority.

For off-patent brands with an exact generic equivalent, the principles of value-based pricing are clear. A central principle of reform is that price should be value-reflective to promote
static and dynamic efficiency. In our view, there is no argument for excluding off-patent originator brands from these principles. Indeed the arguments are if anything stronger when applied to off-patent brands, since under current arrangements there are some extreme examples of prices not reflecting value to patients.

However, it is important to maintain the impetus for generic prescribing, hence retaining incentives for generics to enter the market. In the light of this, we would recommend that originator brands be reimbursed up to 25 per cent above the generic price.

Key challenges: principles, information and institutions

Most companies we have spoken to have recognised the merits of value-based pricing in principle but have had major concerns about how it has been applied in practice in a number of countries. If cost effectiveness assessment is not conducted properly, or is simply used as a veil for arbitrary cost cutting, investment incentives will be undermined. They have stressed to us that, to make a compelling case for reform, we would need to set out in detail the principles, institutions and processes that would underpin any alternative scheme. These concerns are entirely legitimate and we are grateful for the constructive debate we have had with companies and key NHS stakeholders about how to address them. Some of the key issues are addressed below.

Principles for assessing cost effectiveness

In relation to the assessment of cost effectiveness, we fully subscribe to the view that value-based pricing should take account of the incremental benefits drugs bring. Some countries have implemented reference price schemes in which different drugs are grouped together and priced at a flat rate. If this ignores relevant patient benefits, we do not think it is consistent with value for money or giving good incentives to invest. We are also sympathetic with company views that the notion of therapeutic value should embrace not just benefits to the patients themselves but to others who are affected by their condition, such as carers. In recent assessments, NICE has made some moves in this direction and this is to be welcomed.

Some companies have also expressed to us the view that on-patent brands should not be compared against generics in considering cost effectiveness as this will reduce incentives to invest in new drugs. We do not agree with this position. In our view, given the limited resources the NHS has at its disposal, it cannot afford, on grounds of both efficiency and fairness to patients, to ignore relevant comparators on the grounds that they are ‘too cost effective’. If the best available treatment is a generic, then new treatments must demonstrate their benefits in relation to the generic to receive higher prices. In the long run, we agree this will have effects on incentives to invest, but we believe they will be entirely positive, encouraging companies to target areas of unmet patient need.

Informational requirements

Another key consideration concerns the informational requirements of a value-based approach to pricing. We should first stress that adequate information on the clinical and cost effectiveness of a drug is an absolute prerequisite for rational prescribing behaviour, whether or not a value-based pricing approach is adopted. Further, the experience of other countries such as Sweden shows that value-based pricing approaches are perfectly practicable with resources that are much more modest than those we currently enjoy in the UK. But we recognise also that companies need to be supported if they are to meet the requirements of a more value-conscious NHS. In this respect, we strongly support the recommendations of the recent Cooksey Review, which calls for a range of measures (such as public support for
early-stage health technology assessments) to help companies negotiate the ‘Critical Path’ of drug discovery, development and commercialisation.

**Institutional design**

Under any value-based reform, the credibility of the institution carrying out the cost effectiveness assessment is key. Institutions need to work well and to be seen to work well. They therefore need to be competent and credible in the eyes of key stakeholders. While individual views inevitably differ, it is clear that the bodies that carry out health technology assessments in the UK, particularly NICE and SMC, are among the most respected in the world. We believe that they should play a central role in any value-based pricing scheme and have set out some options for how this might work in the medium and long term.

We recognise that there is case for improvement on some fronts to ensure companies are fully engaged in the process of assessment. For example, there should be earlier stage engagement with the bodies to help companies understand the sort of evidence they will be required to produce. Here again, the recommendations of the Cooksey Review are to be welcomed. This and – most importantly – the ability to reach more flexible solutions such as risk sharing agreements should help improve trust and reduce the contentiousness of decision making.

**Recommendation**

*We recommend that Government work towards reforming the PPRS, replacing the existing profit cap and price cuts with a value-based approach to pricing.* We believe that both of the value-based pricing options we have identified would be a major improvement on current pricing arrangements, helping to secure value for money for the NHS and avoiding the increasingly arbitrary nature of PPRS controls.

In the long run we believe the ex ante approach is to be preferred as it will do the most to ensure efficient pricing and uptake of drugs. We recognise, however, that any new arrangements would need to be phased in appropriately. Major changes to the system should not be rushed. The precise timetable for reform would be a matter for Government, in discussion with industry, to consider.

We have developed proposals for a revised institutional framework that could apply from 2010. This would not entail wholesale institutional reform but would require greater coordination between the existing cost effectiveness bodies. We think there is merit in considering whether to establish a fully independent pricing authority – a Medicines Pricing Commission – although we recognise that this would be a longer-term option, as it would require primary legislation.

If implemented, our recommendations will have significant implications, involving a major reallocation of drug spend in the long run. These changes will create winners and losers and will clearly not be popular with some companies. But companies that are successful in producing drugs that make major improvements to patients’ lives will prosper. In our view, that is the essence of effective competition.
1 INTRODUCTION

1.1 Every year the NHS spends about £11bn on drugs prescribed in primary care and hospitals. About £8bn of this expenditure is on branded drugs. This is a study of the Pharmaceutical Price Regulation Scheme (PPRS), one of the main instruments employed by the UK Health Departments to control NHS expenditure on these branded drugs.

Remit of the study

1.2 This study was launched on 13 September 2005. Its remit is to assess whether the PPRS is effective in meeting its high-level objectives, or whether there is a case for reform. The objectives of the scheme are to:

   'Secure the provision of safe and effective medicines for the NHS at reasonable prices, promote a strong and profitable pharmaceutical industry capable of such sustained research and development expenditure as should lead to the future availability of new and improved medicines, and encourage the efficient and competitive development and supply of medicines to pharmaceutical markets in this and other countries.'

1.3 While the objectives are discussed in more detail in the report, we interpret them to mean that the scheme aims both to secure value for money for the NHS and to provide companies with good incentives to invest in beneficial medicines in the future.

1.4 In carrying out the study, we have benefited from constructive discussions with many stakeholders in Government, the NHS and the pharmaceutical industry, both in the UK and abroad. We are grateful for the time they have given us and the expertise they have shared. We are particularly grateful to officials at the Department of Health (DH) and the Association of the British Pharmaceutical Industry (ABPI), whom we have met on many occasions throughout the course of the study.

1.5 The study reflects internal OFT analysis but has also been informed by advice from external experts on a number technical areas.¹

Overview of the scheme

1.6 The PPRS is an agreement between the UK Health Departments and the pharmaceutical industry represented by the ABPI. It is a ‘voluntary scheme’ under section 33 of the Health Act 1999.²

1.7 The PPRS itself has operated in various forms since 1957. In total there have been nine periodic agreements under the PPRS and its predecessor, the Voluntary Price Regulation Scheme (VPRS). In its present form the scheme has two main components:

¹ Dr Neal Maskrey (of the NHS National Prescribing Centre) and a number of other clinicians, pharmacologists and pharmacists advised us on the clinical efficacy and use of a number of medicinal products. Oxera developed the conceptual framework and carried out the financial modelling described in Annex I. Oxera and Professor Emmanuel of the University of Glasgow advised on aspects of the financial analysis, see Annex H.

² Sections 33 – 38 of the 1999 Act provide the statutory basis to the PPRS. From 1 March 2007, those provisions will be replaced by sections 261 to 268 National Health Service Act 2006. The legal framework for pharmaceutical pricing and related matters is discussed in Annex G.
The Pharmaceutical Price Regulation Scheme

- **profit controls**, which set a maximum level for the profits that a company may earn from the supply of branded drugs to the NHS. The profit control also enables companies to increase prices if their profits fall below a given minimum, and
- **price controls**, which give companies freedom to set the initial price of new active substances but impose restrictions on subsequent price increases. They also comprise **price cuts**, which are agreed at the time of scheme renegotiations. A seven per cent cut was agreed as part of the negotiation of the current PPRS scheme beginning in 2005. Companies are given some flexibility in deciding how to deliver savings from price cuts across a portfolio of products, a system known as price modulation.

1.8 These controls are discussed in greater detail in Chapter 4 and Annexes H and J of this report.

**Report structure**

1.9 **Chapters 2 and 3** of the report consider the role of the PPRS from two different perspectives. Chapter 2 focuses on the role of the PPRS in the UK. It examines competition within markets for prescription medicines in the NHS and considers features of supply and demand that influence competitive processes in those markets. It shows how the need for a national level pricing scheme is underpinned by demand side problems in other parts of the NHS and suggests that the PPRS is best thought of not as a regulatory scheme but as a means of exercising buyer power in the purchase of prescription pharmaceuticals across the UK.

1.10 **Chapter 3** considers the impact of UK prices – and hence the PPRS – on incentives to invest in pharmaceuticals. Given the cost structure of the industry, these incentives must be understood at a global level. Hence this Chapter focuses on the factors influencing global investment decisions and the importance of the PPRS among them. UK prices are found to have a particularly important effect on investment incentives, largely through the influence they have on prices in other parts of the world.

1.11 Together, these Chapters provide the necessary context for understanding the role of the PPRS. On this basis **Chapters 4, 5 and 6** assess the effects of the scheme and the case for reform.

1.12 **Chapter 4** takes forward the analysis with a more detailed assessment of PPRS price and profit controls, identifying the incentives that arise out of them and the extent to which they help secure the scheme’s objectives.

1.13 **Chapter 5** sets out options for reform to the scheme, relating both to off- and on-patent brands. In relation to on-patent brands, consideration is given to options for incremental reform to profit and price controls and the case for reform in the direction of pricing controls based on the therapeutic value of individual products.

1.14 Finally, **Chapter 6** presents our recommendations – centred on reform of the scheme in the direction of value-based pricing – and sets out a proposed institutional framework to implement our proposals.

1.15 The issues addressed in this study are wide-ranging and in some cases complex. This report is therefore supplemented by several detailed annexes that contain more in-depth analysis of a number of areas. Reference is made to these annexes at relevant points in the report.
This level of detail is motivated by the fact that a key objective of this study is to improve the terms of debate about pharmaceutical pricing and reimbursement, not just in the UK, but internationally. Against the backdrop of increasing pressures on health budgets and ever-higher drug development costs, health policymakers around the world increasingly have to make difficult decisions about the affordability of pharmaceuticals. Such decisions are unavoidable, but they need to be based on an informed, rational debate about how to make the best use of available resources. We hope that the views set out in this report will be a useful contribution to that debate.
2 MARKETS FOR PRESCRIPTION PHARMACEUTICALS IN THE NHS

2.1 This Chapter examines competition within markets for prescription medicines in the UK. It identifies the range of markets affected by the PPRS and considers the relevant features of supply and demand that influence competitive processes in those markets. As noted, this analysis is a prerequisite for understanding the role the PPRS, its likely effects (considered in Chapter 4) and the case for reform of the scheme (set out in Chapters 5 and 6).

2.2 A more detailed analysis of the issues set out here is provided in Annexes A, B and C.

The NHS drugs bill

2.3 In total, we estimate that the NHS spent about £11 billion in 2005 on pharmaceuticals across the UK, reflecting both reimbursement of pharmacies for dispensing drugs in primary care and direct expenditure by hospitals. This is between 12 and 18 per cent of NHS expenditure on services in all four countries of the UK. Of this total, we estimate that about £8 billion was spent on branded drugs and £3 billion on generics. PPRS price and profit controls between them apply to almost all branded expenditure in the UK.

2.4 Table 2.1 shows how this expenditure breaks down by country and into branded and generics spend for the primary sector. Data are from 2005, which is the last year for which data are available across the UK.

Table 2.1: Expenditure on prescription medicines in primary care in the UK, 2005

<table>
<thead>
<tr>
<th>£ millions</th>
<th>England</th>
<th>Wales</th>
<th>Scotland</th>
<th>N Ireland</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generics</td>
<td>1,979</td>
<td>132</td>
<td>330</td>
<td>51</td>
<td>2,492</td>
</tr>
<tr>
<td>Brands</td>
<td>5,522</td>
<td>402</td>
<td>554</td>
<td>286</td>
<td>6,764</td>
</tr>
<tr>
<td>Total</td>
<td>7,501</td>
<td>534</td>
<td>884</td>
<td>337</td>
<td>9,256</td>
</tr>
<tr>
<td>Total (minus clawback)*</td>
<td>6,800</td>
<td>500</td>
<td>800</td>
<td>300</td>
<td>8,300</td>
</tr>
</tbody>
</table>

* Estimates quoted to nearest £100m.

Source: prescriptions statistics; and OFT calculations. The figures may differ slightly from those quoted elsewhere. Totals may not equal sum of constituents due to rounding.

2.5 Table 2.1 shows that primary care expenditure at list / Drug Tariff prices totalled £9.2 billion in 2005. As explained later in this Chapter, the amount actually paid is somewhat less than this due to clawback of pharmacy margins (See Annex A). After allowing for clawback, total expenditure reduces to about £8.3 billion. On this basis, total primary care expenditure on brands was about £6.1 billion in 2005.

---

3 Here, as elsewhere in the report, the term ‘market’ should be understood in a general sense, as referring in broad terms to the processes by which companies compete to supply a particular component of demand. Unless otherwise stated in the text, no inferences should be drawn from these statements as to the precise market definition that might apply in any particular Competition Act or merger investigation, as this will depend on the circumstances of the case and the particular hypotheses being considered.

4 Prescription cost analysis (PCA) data provided by the Prescription Pricing Authority (England), Health Solutions Wales, the Information Services Division Scotland and the Central Services Agency (Northern Ireland).

5 These are prices at which drugs are reimbursed in the NHS as explained in Annex A.
2.6 Data is less readily available for hospitals but Table 2.2 provides our estimates of expenditure in the secondary sector.

Table 2.2: Estimated expenditure on prescription medicines in secondary care in the UK, 2005

<table>
<thead>
<tr>
<th>£ millions</th>
<th>England*</th>
<th>Wales</th>
<th>Scotland</th>
<th>N Ireland†</th>
<th>Total*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generics</td>
<td>400</td>
<td>24</td>
<td>43</td>
<td>8</td>
<td>500</td>
</tr>
<tr>
<td>Branded</td>
<td>1,600</td>
<td>104</td>
<td>183</td>
<td>62</td>
<td>2,000</td>
</tr>
<tr>
<td>Total†</td>
<td>2,000</td>
<td>128</td>
<td>225</td>
<td>70</td>
<td>2,400</td>
</tr>
</tbody>
</table>

*Figures quoted to nearest £100m. † N. Ireland figures exclude VAT
Source: various; and OFT estimates. Totals may not equal sum of constituents due to rounding.

2.7 The data for hospital expenditure are estimates of the amounts hospitals paid wholesalers (or sometimes the manufacturer directly) for drugs. Availability of these data varies from country to country and in some cases we have had to make estimates of hospital branded and generic expenditure. In total, about £2.4 billion was spent in hospitals, of which we estimate that roughly £2 billion was spent on branded drugs at manufacturers’ selling prices.

Growth of prescribing expenditure

2.8 Expenditure on prescription medicines has been rising at a steady rate, despite the seven per cent price cut imposed across branded products in 2005, which led to a slight reduction in overall expenditure relative to 2004. The recent growth of expenditure in the community (where most of the drugs bill is incurred and data tend to be more comprehensive) is shown below.

Table 2.3: Growth of the community drugs bill in the UK, 2000 to 2005

<table>
<thead>
<tr>
<th>Average annual growth (nominal)</th>
<th>England</th>
<th>Wales</th>
<th>Scotland</th>
<th>N Ireland</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.3%</td>
<td>12.8%</td>
<td>7.0%</td>
<td>8.0%</td>
</tr>
</tbody>
</table>

Source: see Table 2.1.

2.9 DH analysis for England suggests that most of the increase (five per cent) has been due to an increasing number of prescriptions per head of the population rather than increases in the cost per prescription (1.7 per cent). Trends in the average cost per prescription reflect a number of factors, including substitution of generics for more expensive branded drugs as drugs go off patent.

2.10 The proportion of expenditure on generics has doubled over the last ten years. The situation in the community in England is depicted overleaf.

---

6 See Annexe A for details.
2.11 Prescription drugs, like most other NHS expenditure, are mainly funded from general taxation. The contribution made by patients is small.

2.12 The prescription charge is collected in the community by pharmacies and remitted to central government. It is currently £6.65 in England, Scotland and Northern Ireland, and £4.00 in Wales. Prescription charges are not levied on in-patients in hospitals.

2.13 The majority of community prescriptions do not attract the charge due to exemptions (e.g. for the elderly, young, unemployed) and the charge will be phased out altogether in Wales from April 2007. The part of the community drugs bill that was paid for by prescription charges in 2004 is shown in Table 2.4 below.

<table>
<thead>
<tr>
<th>England</th>
<th>Wales</th>
<th>Scotland</th>
<th>N Ireland</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.6%</td>
<td>3.2%</td>
<td>4.6%</td>
<td>3.6%</td>
</tr>
</tbody>
</table>

Source: PPA, HSW, ISD Scotland and CSA Northern Ireland; and OFT calculations

2.14 These are very low levels of contribution by international standards. Almost all countries in the world have a higher proportion of patient contributions (an exception is the Netherlands). This fact is central in understanding the functioning of markets to prescribe and dispense drugs in the NHS, which is the main focus of analysis in the following sections of this Chapter.

7 In 2004 the prescription charge was £6.40 in all countries except for Scotland where it was £6.00. The table captures revenues from prepayment certificates (covering patients for all prescriptions needed during three-month and twelve-month periods) as well as charges levied at the point of dispensing in community pharmacies.
Demand for prescription medicines in the NHS and the role of the PPRS

2.15 The NHS can be split up into primary (or ‘community’) care and secondary (or hospital) care segments. The process of supplying drugs to patients differs between these two segments.

2.16 In primary care, GPs write prescriptions for drugs, which a patient then takes to a pharmacy. The pharmacy dispenses the drug in question, either at the flat prescription rate or, more commonly, for free. Pharmacies are responsible for purchasing the drugs either directly from manufacturers or through wholesalers. They are reimbursed by the NHS for the cost of these drugs.

2.17 In secondary care, a hospital clinician will prescribe a drug, which is then dispensed by the hospital pharmacy. Hospitals are responsible for purchasing the drugs they dispense. Unlike primary care pharmacies, however, they are not reimbursed directly for doing so – they must draw on the overall NHS revenues they receive for treating patients. Patients do not pay for drugs supplied in hospitals.

2.18 As these brief descriptions suggest, demand for drugs within the NHS (particularly in primary care) is characterised by a complex set of principal-agent relationships, in which:
   - the person who consumes the drug (the patient) neither decides nor, in most cases, pays
   - the person who decides which drug should be used (the prescribing doctor) neither pays nor consumes, and
   - the institution that pays for the drug (the NHS / Government) neither consumes nor decides.

2.19 The PPRS is a means by which one component of demand – the payer – seeks to constrain the prices of branded prescription medicines. As discussed elsewhere in this report, the constraints include a series of price controls and a cap on profits that companies can earn on the sale of branded drugs to the NHS.

2.20 Therefore, despite its name, the PPRS is not truly a regulatory mechanism (that is, one that constrains commercial relations between two third parties). Rather, it represents an attempt to exercise buyer power in the purchase of prescription medicines across the UK. In this regard it operates alongside numerous other demand-side controls and incentives at national and local levels of the NHS.

2.21 Notable among these are the bodies charged with evaluating the cost effectiveness of drugs and other medical interventions in the UK: the National Institute for Health and Clinical Excellence (NICE), which operates in England and Wales; the Scottish Medicines Consortium (SMC), which operates in Scotland; and the All Wales Medicines Strategy Group (AWMSG), which operates in Wales. The specific role of these bodies is discussed in greater detail in Annexe B.

The structure of NHS demand

2.22 The diagram below provides an overview of financial flows and control mechanisms relating to expenditure on branded pharmaceuticals in the NHS.

---

8 There is also tertiary care. This is specialised consultative care, usually on referral from primary or secondary care personnel, by specialists working in a center that has personnel and facilities for special investigation and treatment. Cancer treatment centres are an example.
2.23 The table overleaf identifies the main types of market relevant to the supply of prescription pharmaceuticals to patients in primary and secondary care. At each level, it shows the incentives of NHS agents in terms of how they are remunerated for prescribing or purchasing decisions, the price they or the NHS pay and identifies the types of companies competing to supply. PPRS price controls constrain the manufacturer’s list price, which is highlighted in the table in bold.

2.24 The remainder of the chapter assesses competition within these markets in primary and secondary care.

**Competition in primary care to influence GPs**

2.25 The bulk of NHS expenditure on drugs is incurred in primary care. The role of GPs in deciding on which drugs resources should be spent is therefore key. This section reviews the nature of competition between drug manufacturers to secure a GP’s prescription. It considers the factors that influence GP prescribing behaviour, presents the results of new research into GP price sensitivity and assesses to what extent current prescribing practices lead to efficient outcomes.
Overview of prescribing within primary care

2.26 In all four countries, the delivery of frontline healthcare, including medicines, is centred on primary care organisations (PCOs), a general term for English Primary Care Trusts and what are usually referred to as Health Boards in Wales, Scotland and Northern Ireland. Collectively, PCOs receive around 80 per cent of NHS funds and individually they manage the delivery of most health care to populations of 100,000 to 300,000. Each PCO’s share of available funds is determined by the demographics and relative health needs of its local population, using assessment methodologies that vary across the four countries.

2.27 With regard to primary care prescribing, PCOs manage GPs under the terms of a UK-wide General Medical Services (GMS) contract. PCOs seek to encourage GPs to prescribe cost-effectively through local incentive schemes and other arrangements.

Relevant markets in primary care

2.28 It is possible to identify three broad types of market of relevance to prescribing and dispensing in primary care. These are shown in Figure 2.3.

Figure 2.3: Markets relevant to prescribing and dispensing drugs in primary care

<table>
<thead>
<tr>
<th>Activity</th>
<th>Competition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision maker: GP issues a prescription. This is either written generically, or for a particular brand.</td>
<td>Manufacturers of therapeutically similar treatments compete to secure GP’s prescription</td>
</tr>
<tr>
<td>Branded Prescription: Pharmacist dispenses a branded drug</td>
<td>The branded manufacturer competes with parallel importers to supply pharmacies</td>
</tr>
<tr>
<td>Generic Prescription: Pharmacist dispenses either a generic or branded drug</td>
<td>The branded manufacturer, generic manufacturers and parallel importers compete to supply pharmacies</td>
</tr>
</tbody>
</table>

a – or generic prescription when drug is on-patent  
b – providing generics are available

2.29 At the upstream level in this supply chain, GPs make decisions on how to treat a particular condition and can issue a prescription. Within this market, competition is from all therapeutically similar treatments that the GP could prescribe. Pharmaceutical firms are active in this market in seeking to persuade GPs of the benefits of their products, to get them prescribed. Competition at this level is the focus of the rest of this section.

2.30 Once the GP has written the prescription, there are two types of downstream markets in which suppliers compete to supply pharmacies to dispense drugs against this prescription. These differ depending on whether the prescription written by the GP is for a branded drug, or whether it is written generically (that is, by chemical name) and also on whether generic versions of the drug in question are available (largely determined by whether the drug is on- or off-patent). The nature of competition in these downstream markets is analysed later in this Chapter.
# Table 2.5: Summary of competition in drugs markets in the UK

<table>
<thead>
<tr>
<th>Agent</th>
<th>Share NHS demand</th>
<th>How reimbursed for pharmaceutical expenditure</th>
<th>Price paid for pharmaceuticals</th>
<th>Parties competing to supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Care</td>
<td>c. 75%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCOs</td>
<td></td>
<td>Formula based on population characteristics produces unified budget from which PCO apportions drug spend</td>
<td>Manufacturer’s list price less average clawback</td>
<td>Manufacturers of all therapeutically substitutable products compete to secure GP’s prescription</td>
</tr>
<tr>
<td>GPs</td>
<td></td>
<td>GPs do not pay for drugs and so are not reimbursed for drug spend. Some contractual incentives relate to list price and Drug Tariff price</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharmacies</td>
<td></td>
<td>List price less claw back based on volumes</td>
<td>Market but list price imposes ceiling</td>
<td>Manufacturer of brand (either directly or through a wholesaler) competes with parallel importers to supply pharmacy</td>
</tr>
<tr>
<td>(when GP has prescribed a brand or on-patent drug)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharmacies</td>
<td></td>
<td>Drug Tariff price (primarily Category M) less claw back</td>
<td>Market but list price of originator on patent expiry imposes ceiling</td>
<td>Suppliers of all chemically identical drugs (brand and generic manufacturers) compete to supply pharmacy</td>
</tr>
<tr>
<td>(when GP has prescribed off-patent drug generically)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary Care</td>
<td>c. 25%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitals</td>
<td></td>
<td>England – National Tariff for healthcare interventions. W and NI – commissioning revenues (no tariff). Sc – funds agreed with AHB. DH pays for some high-cost drugs directly</td>
<td>Market (but list price imposes a ceiling)</td>
<td>Manufacturers of all therapeutically substitutable products (subject to clinician compliance with formulary) including parallel importers</td>
</tr>
</tbody>
</table>

---

a – With the exception of Dispensing Doctors, who pay market prices and are reimbursed at list / Drug Tariff price, hence gaining from any margin.

b – Pharmacies typically purchase domestically-sourced drugs from wholesalers at list price minus about 10.5%. The supply chain is described in Chapter 6.

c – Drug Tariff Part VIII lists reimbursement prices for generic drugs (Categories M, A, B and C).
Markets to secure a GP’s prescription

2.31 To treat a given condition, GPs choose between groups of medicines that are therapeutically substitutable. Depending on the patient’s medical history and condition, the range of appropriate medicines may be broad or narrow. Often, but by no means always, the list of products appearing in a relevant ‘Paragraph’ of the British National Formulary (BNF) represents the available scope for choice.

2.32 BNF paragraphs can contain one or two, and up to sometimes ten or more, medicines with somewhat different chemical actions, interactions, side-effects and evidence bases, and which may be on- or off-patent. Members of the same BNF Paragraph are all designed to treat the same condition of a specific part or system of the body (though some may have alternative uses).

2.33 A BNF paragraph can therefore in some cases be considered in broad terms to constitute a ‘market’ for drugs to treat a given medical condition. However, it is important to note that in Competition Act investigations or merger decisions, appropriate market definitions may be wider or narrower than the Paragraph according to the individual circumstances and the specific question being addressed. This is discussed in the box below.

Box 2.1: Market definitions relevant to prescribing behaviour

A standard approach to defining markets for drugs (taken by the European Commission, for example) is to use the Anatomical Therapeutic Chemical (ATC) classification devised by the European Pharmaceutical Marketing Research Association (EphMRA). The World Health Organisation maintains a similar classification.

Within the ATC system, drugs are grouped according to the organ or system on which they act – the first level of analysis – and their therapeutic, pharmacological and chemical properties – the second, third, fourth and sometimes fifth levels of increasingly specific classification. An example from EphMRA is:

- N Nervous system
- N6 Psychoanaleptics excluding anti-obesity preparations
- N6A Anti-depressants and mood stabilisers
- N6A4 SSRI anti-depressants
- Prozac® (A branded product, chemical name: fluoxetine)

The European Commission considers the third level of analysis – ATC3 – (in the above example ‘C10A’) to be a suitable starting point for market definitions in competition cases. However, the Commission regularly carries out analyses at other ATC levels, or a mixture thereof, recognising that relevant economic markets can be wider or narrower than ATC3, or do not fit neatly into one of the ATC levels. The guiding principle is that products should be included in the same market if they are substitutable for the same purpose.

Often, markets are judged to be narrower than ATC3 or even ATC4. Even medicines with identical active ingredients may have distinct therapeutic uses according to their delivery technology, their side-effects resulting from the presence of chemicals other than the active ingredient, their reputation and other factors influencing their functional substitutability in the eyes of clinicians. The OFT took these factors into account in the Competition Act 1998 decision concerning Napp pharmaceuticals. There, the market relevant to the undertaking’s brand was narrowly defined as ‘sustained-release morphine tablets and capsules’. Other factors in addition to therapeutic substitutability will also inform market definition, such as price.

9 Decision of the Director General of Fair Trading No CA98/2/2001, 30 March 2001, Napp Pharmaceutical Holdings Limited and Subsidiaries. This decision was appealed to the Competition Appeal Tribunal on 29 May 2001. On 15 January 2002 the Competition Appeal Tribunal upheld substantially the Director General of Fair Trading’s decision on liability.
The analysis presented later in this annexe uses the British National Formulary, which organises drugs in a similar but not identical way to the EphMRA scheme. The BNF uses Chapters, Sections, Paragraphs and Sub-paragraphs that are equivalent to ATC levels 1 to 4 above.

Generic prescribing

2.34 It is important to note that GPs are encouraged to write prescriptions using the drug’s chemical name, whether or not the product in question is out of patent, unless there are specific clinical reasons not to. This is typically known as ‘generic prescribing’ and is encouraged throughout a product’s life cycle.

2.35 This policy is motivated by both safety and cost concerns. There are sometimes many brand names for one medicine and possible confusion or mistakes are reduced if all doctors use the same names when discussing and prescribing drugs. Also when a branded medicine’s patent expires, generic equivalents that appear in the market are usually cheaper for the NHS but, for a pharmacist to be able to dispense a generic, a prescription must be written by a drug’s chemical name.

2.36 The chart below shows how generic prescribing increased in England from 1995 – 2005. In total, prescribing by chemical name accounted for about 70 per cent of primary care expenditure in England in 2005, up from just over 40 per cent in 1995. The overall generic prescribing rate and breakdown are similar in Scotland and Wales but Northern Ireland has an overall generic prescribing rate of only 45 per cent.

Figure 2.4: Generic prescribing in the community, England 1995-2005

The British National Formulary prints advice about generic prescribing with each drug entry.
Generic prescribing has increased markedly over the past ten years in the UK. However, there is still significant expenditure on off-patent brands for which equivalent generics are available at much cheaper prices. This is taken up later in the Chapter.

In conclusion, in each individual case, the market for a GP’s prescription will be defined according to concepts of substitutability: where products are considered substitutable, this will lead to a broader market definition. The main form of competition is between suppliers of substitutable drugs in each market to influence GPs’ prescribing decisions. In the next sub-section we consider the various influences on prescribing decisions.

Factors influencing GP decision making

The many influences that act on GPs’ prescribing decisions (and their assessments of cost and clinical effectiveness) include:

- the General Medical Services (GMS) contract which determines GPs’ working conditions and provides a framework for their remuneration across the UK
- guidance from national bodies such as NICE, SMC and SIGN, AWMSG and AWPAG, etc
- local measures implemented by PCOs, including prescribing incentive schemes, local formularies and advice from prescribing advisers
- peer pressure, informed by prescribing trend information made openly available within the NHS and the practice of hospital consultants
- the marketing activities of pharmaceuticals manufacturers
- their own, independent assessment of clinical evidence published in scientific journals, and
- pressure from patients who may have an attachment to a particular brand.

Incentives for dispensing doctors, who act as pharmacists to procure and dispense some of the medicines they prescribe, may also include profit.

The relative weight of these influences is discussed in Annexe A. We found that the GMS contract is likely to exert the strongest financial influence on GPs’ prescribing behaviour. While the contract offers many and varied financial rewards to GPs who meet certain clinical standards it provides limited incentives for cost containment. Its net effect is therefore likely to dull GP price sensitivity.

The influence of NICE, SMC and AWMSG on prescribing decisions is discussed in Annexe B of this report. The bodies have certainly helped improve awareness of the importance of cost effectiveness and in many cases their guidance has had an impact on prescriber behaviour. However, guidance is not always followed – indeed, prescribers are not required to do so. Evidence suggests that non-compliance may be more of an issue in primary care compared with secondary care. Implementation is not helped by the fact that in some cases guidance is not reflected in incentives contained in the GMS contract, which, as discussed above, is a major influence on GP behaviour. Furthermore, there are issues concerning drug coverage – NICE in particular does not look at all drugs.

The technical expertise that these bodies bring to bear in conducting cost-effectiveness assessments is of world class standard. However, we believe better use could be made of this expertise in ensuring NHS resources are spent cost effectively. We discuss these issues further in Chapters 4 and 5 of this report.

It is primarily demand side substitutability that is relevant for GPs’ decision making. Supply side substitutability is only likely to be relevant in relation to off-patent brands, for considering possible generic entry.
2.44 The responsibility for containing cost is largely left to PCOs to organise locally. Prescribing incentive schemes pay rewards to practices that contain their expenditure on drugs within agreed annual budgets. These have reduced in importance in recent years as the cost to PCOs of generating incentives to offset the rewards in the GMS contract has become prohibitive. More informal methods, such as the advice of prescribing advisers and organised peer pressure are perhaps the most effective means by which PCOs can influence GPs.\textsuperscript{12} Other initiatives such as the use of local formularies have been used across the UK with varying success.

2.45 In short, there is considerable variation in the effectiveness of local arrangements to encourage cost effective prescribing behaviour. A forthcoming National Audit Office (NAO) study into value for money in primary care prescribing is expected to identify particular best practice examples of approaches used at a local level.

2.46 Marketing expenditure by pharmaceutical companies also has an influence on GPs’ decision making. Companies spent some £850 million on marketing activities in the UK in 2004.\textsuperscript{13} This has led to calls for such expenditure to be curbed. We do not agree that urging companies to reduce such expenditure is the right response to this problem. Companies are simply responding to the financial incentives they are given through current linear price structures, which give companies a constant return for every extra unit prescribed. As we discuss in Chapter 5, we believe a better response to concerns about excessive marketing activity would be to give them better incentives to incur productive expenditure through the use of more flexible – and value-reflective – price structures.

2.47 The awareness of and sensitivity to drug prices among GPs is determined by the balance of all their incentives and influences such as those outlined above. However, it is also important to note that, even if GPs had appropriate incentives to take costs into account, there would still be issues in terms of adequate access to information. GPs typically have insufficient time to acquaint themselves with data on the relative cost and clinical effectiveness of different drugs. Work undertaken by the National Prescribing Centre to advise clinicians on the efficient use of information observes that the journal articles and NHS guidance pertaining to any individual clinical decision can run into many thousands of pages.

2.48 Consistent with many of the above observations, previous studies have found GPs’ awareness of and sensitivity to drug prices to be low. In 2002, a joint study by DH and the Association of British Pharmaceutical Industries (ABPI) investigated GPs’ knowledge of the relative prices of drugs within five therapeutic classes. Overall, participants got around 50 per cent of pair-wise choices between the prices of products in the same therapy class correct, which is consistent with guessing. The same study also reported that, at the time, English GPs deemed cost to be a lower priority than clinical concerns.

2.49 Since the last survey of GP price sensitivity was carried out, there have been some important changes that may plausibly affect GP price awareness, such as the bedding down of NICE and SMC and the onset in some areas of England of Practice-Based Commissioning. For this reason, the OFT collaborated with the NAO to conduct an up-to-date survey, which is summarised in Box 2.3 below and described in more detail in Annexe C.

\textsuperscript{12} It is clear from publicly available data if any one practice is putting strain on a local health economy, for example by ‘over-prescribing’ for particular conditions.

Box 2.3: Recent evidence on price awareness among GPs

This box describes the results of research into GPs’ knowledge of the prices of a number of commonly prescribed drugs. The results are taken from a survey of 1,000 English GPs conducted as part of ongoing research by the National Audit Office into value for money in primary care. The exercise outlined below is described in greater detail in Annexe C of this report.

As part of its survey of GPs, the NAO kindly agreed to the inclusion of a test of price sensitivity designed by the OFT. We asked GPs to rank branded drugs within each of six therapeutic areas in order of price. The areas tested were:

- proton pump inhibitors
- statins
- ACE inhibitors and angiotensin II receptor antagonists (considered together)
- SSRI antidepressants
- other antidepressants, and
- non-steroidal anti-inflammatory drugs.

These groups were included because they are commonly prescribed and familiar to most clinicians. Each group is a major expenditure area containing drugs that are widely agreed to be quite close therapeutic substitutes. Two of the groups – statins and proton pump inhibitors – account for respectively the most and second-most NHS expenditure of any chemical class. All of the six groups are consistently among the ten largest components of the drugs bill.

Each of the groups contains numerous drugs in many presentations. We selected for inclusion the most commonly prescribed branded drugs, forms, strengths and pack sizes, with a view to providing GPs with a manageable list of around six highly recognisable products to rank in each group. There was no attempt to select items that would be especially easy or difficult to assess for price.

Looking at the exercise as a whole, GPs’ ability to rank branded drugs in order of price proved no better than chance. There were, however, differences between the results for different groups: in several groups results were significantly better than would be expected by chance and in others much worse.

Across classes, it appeared that in groups where branded drugs had generic alternatives this sometimes contributed to the difficulty of making correct ranking assessments. The results suggest that GPs may have a systematic perception that off-patent brands have the lowest prices of all brands in a therapeutic group – implying a belief that when a drug goes off patent it lowers its price in response to generic entry. But in fact off-patent brands often do not significantly fall in price in this way.

2.50 In conclusion, while there is likely to be variation between individuals and between products (discussed in Annexe A), awareness of and sensitivity to the relative price of some major branded drugs is fairly weak among primary care prescribers. This is one of the reasons supplementary influences and controls such as the PPRS are required in other parts of the NHS.

2.51 Of course, price is not the only criterion prescribers should take into account. Efficient prescribing behaviour requires a consideration of price relative to the benefits a drug produces – that is, of its cost effectiveness. As suggested below, there is strong evidence that current prescribing practices in the UK do not always meet this criterion.
2.52 It is important to note that, even if prescribers were fully aware of prices and incentivised to respond to them, there would be strong arguments for the centralisation of certain functions within the NHS, such as the assessment of cost effectiveness (these are economies of scale arising from the complexity of the analysis involved) and the negotiation of prices (in order to make effective use of NHS buyer power).

**Static and dynamic competition**

2.53 The focus of this Chapter is on the demand side of pharmaceuticals markets in the UK. Chapter 3 considers features relevant to the supply side – that is, the process of developing and marketing drugs, the nature of the costs involved and companies’ global investment incentives and pricing strategies. Pharmaceuticals markets are characterised by significant barriers to entry, reflecting the high fixed costs required to develop a drug and intellectual property rights companies are granted to protect their investments.

2.54 Therefore, one would expect pharmaceuticals markets in most countries to be fairly concentrated (that is, individual companies will have fairly high market shares). Particular outcomes in any one country will depend on both these supply side factors and key characteristics of demand, of the sort discussed above in the context of the NHS.

2.55 This section provides an overview of evidence on concentration in markets to secure primary care prescriptions in the UK. It begins with a static analysis – a snapshot of concentration at a particular point in time – before looking at how prices and volumes of drugs change over time in response to events such as new entry and substitute products going off patent.

**Static analysis**

2.56 As discussed above, the fundamental nature of competition at the GP level is that companies seek to gain market share by convincing GPs that their products are more clinically effective than rival products for a particular condition (or, to the extent that GPs are price sensitive, more cost effective than rival products). Accordingly, drugs markets are routinely defined according to the principle of therapeutic substitutability.

2.57 The table below shows one measure of concentration in UK drugs markets defined at the level of the BNF Paragraph. It is important to note that there are other measures of concentration and to reiterate that in many cases markets may be defined at very different levels to these. The analysis here is simply intended to give a broad brush overview of the extent of competition across all Paragraphs of the BNF.

<table>
<thead>
<tr>
<th>Country</th>
<th>Market Value at reimbursement prices £million</th>
<th>% of market value</th>
<th>Number of markets</th>
<th>% of markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td>4,307</td>
<td>56.3</td>
<td>215</td>
<td>62.7</td>
</tr>
<tr>
<td>Scotland</td>
<td>270</td>
<td>60.3</td>
<td>217</td>
<td>72.8</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>107</td>
<td>61.0</td>
<td>235</td>
<td>85.5</td>
</tr>
</tbody>
</table>

Note: Welsh data are not susceptible to this analysis.

Source: PCA Data
2.58 Table 2.6 shows the number of BNF Paragraphs where a branded drug has a share exceeding 40 per cent. Competition authorities often consider markets where a firm has a share of 40 per cent or more of sales to be highly concentrated and, in a formal Competition Act 1998 investigation, a firm is unlikely to be considered dominant if it has a share below 40 per cent of the relevant market.14

2.59 Table 4.1 shows that across the UK between 62 and 86 per cent of ‘markets’ as defined above feature a firm with a market share of greater than 40 per cent. These markets account for between 56 and 61 per cent of NHS expenditure on prescription medicines. These numbers have increased slightly since 2000.

Dynamic analysis

2.60 Given the innovative nature of the industry, one would expect market shares to change over time, as new drugs enter markets, taking the place of older products. In Annexe A we discuss trends in prices and volumes in four major markets: the proton pump inhibitors; the angiotensin II receptor antagonists (for high blood pressure); the selective serotonin reuptake inhibitors (SSRIs, a class of antidepressants); and the statins (for cholesterol).

2.61 The analysis suggests that:
• typically brands are launched at a discount to the incumbent in a market
• prices are closely bunched in each market, particularly in later years. Price differences between the first and subsequent launches consistently erode over time, and
• the general trajectory of prices in all markets is downwards. This reflects the mechanisms of the PPRS, in particular the price cuts and constraints on increasing the list price, as discussed in Chapter 4. Prices are reduced outside of the obligatory cuts only very rarely.

2.62 The graphs below show the changes in prices and volumes of the statins over time.15 The graphs show that volumes of originator brands – Zocor, for example – experience a significant drop when a patent expires, in response to the entry of much cheaper and bioequivalent generic products. This is a commonly observed phenomenon and is a direct outcome of the practice of generic prescribing discussed above. Usually, prescribing of the affected chemical continues along the same trend as before patent expiry but dispensing of the brand is substituted by dispensing of generics.

2.63 However, in the graph prices for simvastatin fell when Zocor lost its patent protection in 2003 and at the same time volumes rose markedly. There are many factors that combine to explain this outcome. Use of all statins has increased greatly in recent years as medical opinion has begun to reach a consensus about the therapeutic value of the class as a whole, for example. However, the example is also consistent with some degree of sensitivity to significant price changes in major drugs. This sensitivity is influenced by the variety of the factors discussed above, such as prescribing advisers and national guidance bodies.

---

14 Again, since this analysis is provided for illustrative purposes, no inferences can be drawn from it about how the OFT or another competition authority might define the market or assess dominance in any particular case in the future. Such an assessment would need to reflect the individual hypotheses relevant to the case.

15 The graphs show prices per unit and volumes of the most commonly prescribed strengths. In some cases, the most commonly prescribed strengths may have somewhat different potency but because the changes in price when a drug goes off patent are so large this would not alter the conclusions. For example in February 2007, the Drug Tariff shows the price of generic simvastatin 20mg was 7.2p, and 40mg was 12.6p, per tablet while the price of Lipitor (branded atorvastatin) 10mg was 64.4p, and 20mg was 88p, per tablet. Thus, even comparing generic simvastatin 40mg with Lipitor 10 mg, Lipitor was more than five times the price.
More significantly, however, Figures 2.5 and 2.6 do not show significant changes in price or volumes of other on-patent statins when simvastatin and pravastatin lost patent protection.\textsuperscript{16} Competition between manufacturers did not lead to significant reductions in the price of substitute products, such as the other statins. Moreover, these substitute products retained significant volume and market shares despite the very significant change in relative price following simvastatin going off-patent. Given the very low prices at which generics are available, sustained prescribing of high-priced brands that may be therapeutic substitutes for many patients, raises potentially very significant concerns about the cost effectiveness of prescribing behaviour. While volumes of some on-patent statins may have fallen somewhat since this analysis was undertaken, the extent of inefficiency remains significant. These concerns are taken up in the concluding section below.

**Figure 2.5: Dynamic competition in statins: prices**

![Graph showing price changes over time for different statins.](image)

Source: PCA data for England is used. Prices are on a per-unit (tablet, capsule) basis.

\textsuperscript{16} A partial exception is Lescol, volumes of which fell gradually from 2003. The prices of two other brands fell in 2005 as part of the implementation of the PPRS price cut. However, as noted in Annexe J, these were likely a competitive response, at least in part, to parallel trade.
As noted, the above analysis does not take explicit account of perhaps the most important dimension in competition between pharmaceuticals – that relating to the relative clinical efficacy of the products concerned. In principle, the lack of a price or volume response to a major price change in a substitute product might be understandable if the two products have very different effects.

However, analysis set out in Annexe M suggests that, under current arrangements, extremely close substitutes have very different prices. Since the products assessed are among the largest selling in the NHS, this has major implications for value for money. We have identified hundreds of millions of pounds of expenditure that could be used more cost effectively – that is, in giving patients access to drugs and other treatments that represent better value for money for the NHS but which are currently rationed. Changes to the pricing regime could help address this.

Arguments concerning therapeutic equivalence are even stronger in relation to an originator product and a generic that is bioequivalent to it. Although here, as noted, there is a volume response to generic entry (through the practice of prescribing by chemical name) price disparities between generics and originator products are such that we estimate that there is still about £65m a year that could be used more effectively across the NHS through the use of more value-reflective prices for off patent brands.\(^\text{17}\)

---

\(^{17}\) DH has already issued a consultation document on the reimbursement of ‘standard branded generics’ on 20 January 2005, suggesting that a range of branded generic products should be removed from the PPRS and reimbursed at the lesser of either the Drug Tariff price of the comparable true generic or the list price of the standard branded generic. DH then carried out a further round of consultation on this proposal, which closed on 24 October 2005. The consultation is on hold, pending the outcomes of this study.
Competition in primary care to supply pharmacies

2.68 NHS contractor pharmacies buy drugs from manufacturers and wholesalers, supply (or ‘dispense’) them to patients with a GP prescription for a particular drug and are reimbursed for doing so by the NHS.

2.69 This section considers the process of competition to supply pharmacies. It first describes the role of pharmacies in primary care and the mechanics of pharmacy procurement and reimbursement before considering competition under two main scenarios: when GPs write a prescription for a brand (or when no generics are available for the pharmacy to dispense); and when GPs write a prescription using the chemical name (and generics are available).

2.70 As discussed above, the nature of competition to supply pharmacies depends on how GPs have prescribed. When pharmacies are obliged to dispense a brand (either because a GP prescribed it or only that brand is available) they are reimbursed at the manufacturer’s list price, which is controlled by PPRS. In such instances, it is suppliers of the branded product that compete to sell to pharmacies. When pharmacies are able to dispense a generic, by contrast, they have more supply options and are reimbursed at Drug Tariff prices.

2.71 The first scenario accounts for about 75 per cent of community expenditure on drugs, while the second – prescriptions written and dispensed generically – accounts for about 25 per cent.

2.72 Before looking more closely at competition in each scenario it is helpful to describe in more detail the mechanics of pharmacy procurement and reimbursement that influence the competitive process. The situation is outlined in the diagram below.

Figure 2.7: Financial flows relevant to primary care in the UK

---

The Pharmaceutical Price Regulation Scheme
The mechanics of pharmacy procurement and reimbursement

2.73 Pharmacies supply drugs to patients at the NHS flat-rate prescription charge (which is remitted to government), or for free, before being reimbursed each month by their PCO. Pharmacies’ payments and working conditions are governed by the national Pharmacy contract, negotiated in 2003 between the Department of Health and the Pharmaceutical Services Negotiating Committee (PSNC).

2.74 Under the pharmacy contract, pharmacies in England received total Government funding of £1,766 million for 2005/06, a figure which has risen to £1,911 million for 2006/07. Contractually, £500 million of the funding comes through retained margin (that is, the margin between the price at which pharmacies buy drugs and the price at which they are reimbursed)\(^1\), and the remainder from professional fees and other payments which depend on the level of service provided.

Reimbursement prices

2.75 The price at which prescriptions are reimbursed depends on whether they are written for a brand or a generic, and on the availability of true generics in the market. There are two scenarios to consider, which we call ‘reimbursing as a brand’ and ‘reimbursing as a generic’ respectively.

- **reimbursing as a brand**: For dispensing branded drugs against branded prescriptions (or against generic prescriptions where no true generic is available, for example when the chemical is still on patent\(^2\)) pharmacies are reimbursed at the manufacturer’s list price less clawback, described below, and

- **reimbursing as a generic**: For dispensing any drug (brand or generic) against a generic prescription where the chemical is off patent and generic supplies are available, pharmacies are reimbursed at a price set down in the Drug Tariff, again less clawback.

2.76 The pricing mechanism for controlling the manufacturer’s list price is the PPRS. Drug Tariff prices are set according to a variety of mechanisms, the most important of which is scheme M, where the price is based on quarterly surveys of transaction prices between manufacturers, wholesalers and pharmacies.

Clawback

2.77 Pharmacies’ total reimbursements are arrived at after applying the clawback, which operates differently around the UK. In England it is a sliding-scale deduction applied to pharmacies’ total monthly payments, but elsewhere it is subtracted from reimbursements for individual items. This is described in the table overleaf.

---

\(^1\) As pharmacy purchase prices can not necessarily be forecast with perfect accuracy, the actual amount (measured from margin surveys) may differ from the contractual amount. In the event, the retained purchase margin for 2006/07 was £650 million, rather than £500 million.

\(^2\) Or when pharmacies can prove to the reimbursement processing authority that they were forced to dispense a brand due to generics being unavailable.
Table 2.7: Clawback arrangements in the UK

<table>
<thead>
<tr>
<th>Country</th>
<th>Clawback on branded drugs</th>
<th>Clawback on generic drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>England and Wales</td>
<td>Between 5.63% and 11.5% of a pharmacy’s total monthly reimbursement depending on size of claim less exempt items. According to the PSNC, nationally the deduction is about ten per cent of value at list prices. Average clawback (including zero discount products) is 9.2 per cent.</td>
<td></td>
</tr>
<tr>
<td>Scotland</td>
<td>9.97%</td>
<td>13.5%</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>c. 9%</td>
<td>c. 13%</td>
</tr>
</tbody>
</table>

1 Dispensed to prescriptions for the brand or an on-patent chemical.
2 Or branded drugs dispensed to prescriptions when generics are available.

Note: slightly different clawbacks apply to dispensing doctors.

2.78 The clawback was designed to share with the NHS the profits pharmacies can make by purchasing drugs at below the price at which they are reimbursed. The sliding-scale system in England and Wales, for example, assumes that the bigger pharmacies, making larger reimbursement claims, can obtain better discounts to list prices than small independents. The systems in Scotland and Northern Ireland assume that discounts are greater for generic drugs.

Retained profit margin

2.79 Pharmacy reimbursement in England includes £500 million retained profit margin. In consultation with the PSNC, DH regularly measures the margin actually obtained by a sample of pharmacies. This covers brands (including parallel imports) and generics and involves auditing all the invoices of the sampled pharmacies for a particular month. The audited margin of the sample of pharmacies is then aggregated to the whole market for England. The PSNC told us that, from next year, margin analysis would be carried out every month. Hitherto, it has been done less frequently.

2.80 The results of the margin analysis are used to ensure that pharmacies receive the retained profit margin of £500 million. This is achieved by adjusting the margin when setting prices for Category M drugs.

Competition to supply pharmacies when a drug is reimbursed as a brand

2.81 When a product is reimbursed as a brand, the suppliers competing to sell into the supply chain are the brand manufacturer and parallel importers. The reimbursement price is the manufacturer’s list price less claw back. For most products dispensed as a brand, the list price is constrained by the PPRS price control (see Annexe J).

Supply chain

2.82 Manufacturers distribute their products either directly or through wholesalers. There are two types of wholesalers: full-line (which carry the entire 25,000 product lines recognised by the NHS); and short-line (which carry only a small proportion of the NHS product list).
2.83 The PPRS price control constrains manufacturers’ list prices. It does not directly constrain manufacturers’ net prices to wholesalers, nor wholesalers’ prices to pharmacies. However, we understand that, under the traditional model of supply through wholesalers, prices through the supply chain are broadly as follows:

- by traditional custom and practice, manufacturers sell to wholesalers at a 12.5 per cent discount to list price
- wholesalers sell to pharmacies at discounts depending on volume, with wholesalers’ discounts averaging perhaps 10.5 per cent, and
- pharmacies are reimbursed by the NHS at list price less clawback (which averages 9.24 per cent of list price across all drugs). Assuming pharmacies buy at 10.5 per cent below list price, this implies average pharmacy margin on drugs of around 1.26 per cent of list price.

2.84 As noted above, the level of pharmacies’ aggregate retained margin in England is set in the pharmacy contract and does not depend on actual aggregate margins. Each individual pharmacy’s margin will however depend on the actual price at which it purchases from wholesalers or manufacturers and on its individual clawback (which depends on its monthly reimbursement total. Each individual pharmacy therefore has the incentive to purchase at the cheapest price.

**Parallel imports**

2.85 Pharmacies are reimbursed at list price, whether they dispense a brand sourced from domestic suppliers or from parallel importers. Thus, pharmacies have a strong incentive to purchase parallel imports if they are available more cheaply than supplies sourced directly from the manufacturer.

2.86 Parallel traders legally export brands from lower-priced to higher-priced countries in the European Union (but to go on to sell them in the UK they must be licensed by the MHRA). When a product is dispensed as a brand, parallel trade is the only source of price competition to manufacturers. UK prices are on average high relative to those in the rest of Europe, making the UK a major destination for parallel trade. In 2005, parallel imports supplied about 18 per cent by value of branded drugs prescribed in UK primary care, or about £1.25 billion at list prices.

**Summary and conclusions on reimbursing as a brand**

2.87 The NHS reimburses pharmacies at manufacturer’s list price (which is constrained by the PPRS price control) less clawback (which depends on the pharmacy’s monthly reimbursement total). Each pharmacy’s reimbursement price is not affected by what it actually pays for the brand, and hence pharmacies are motivated to purchase from the cheapest source of supply. The cheapest source of supply may be direct from the manufacturer or from a wholesaler which may itself source from parallel imports or the manufacturer.

2.88 We have not had access to information on pharmacies’ actual margins but rough estimates suggest that the average margin on UK-sourced supplies is about 1 to 1.5 per cent of list price.
Competition to supply pharmacies when a drug is reimbursed as a generic

2.89 When GPs write generic prescriptions for an off-patent chemical, a range of suppliers compete to sell to pharmacies. Competing suppliers include the manufacturer of the originator brand, makers of all bioequivalent generics (including branded generics) and parallel importers.

2.90 The supply chain for generics is similar to that for branded drugs, involving manufacturers, wholesalers (short line and/or full line) or direct supply and pharmacies. Competition between generic manufacturers tends to be vigorous, and consequently for most products they have little ability to sell at higher prices in the UK than other EU countries. Hence, parallel imports of generics tend to be unimportant.

2.91 Individual pharmacies’ reimbursement prices for generic drugs do not depend on what they individually pay for the drug. Again, therefore, pharmacies are strongly motivated to purchase from the cheapest supplier. We discuss some aspects of competition to supply pharmacies in the following sections. We consider first competition between generic manufacturers through Scheme M and second competition between branded and generic suppliers.

Competition between generic manufacturers: Scheme M

2.92 Around 90 per cent of generic medicines (by value) are listed under Category M of the Drugs Tariff. Prices for drugs in Category M are set by DH and are based on a calculation that incorporates the volume-weighted average prices charged by generics manufacturers in the UK.20

2.93 The use of average prices among manufacturers aligns the reimbursement of generic drugs with the market conditions in which they are sold. This process maintains the incentives for individual pharmacies to procure generic drugs efficiently, as reimbursement is based on average prices and pharmacies can negotiate with suppliers to secure a better than average price. Rules governing this system are set out in an agreement known as Scheme M.

2.94 Scheme M has led to strong competitive pressure on generics prices, with UK prices held to be among the lowest in Europe. The system is considered to be a well managed and efficient form of pricing generics, which has worked well to ensure that competition between generic manufacturers delivers savings for the NHS. There was, initially at least, some concern about the volatility of generics prices, although these have now largely been addressed.

2.95 However, under the current arrangements, drugs dispensed as generics contribute the bulk of the £500 million retained pharmacy margin under the pharmacy contract, and pharmacies’ average margin on generics is considerably higher than on brands. While margins on domestically sourced brands are generally about 1 to 1.5 per cent, we understand that margins on some generics, in particular some category M drugs, are much higher – sometimes over 50 per cent.

2.96 The reimbursement regime is very different for on-patent brands, which are currently priced under PPRS. The very different level of margin attached to generic and branded reimbursement is a potential source for concern. This can be a source of considerable advantage to branded manufacturers competing with generics, since it allows them to market their products to GPs and PCOs as cheaper than generics and yet still to sell to pharmacies at a much higher price. This has the potential to distort competition between brands and generic equivalents in the market for GP prescriptions.

---

20 The average is a volume-weighted average factory-gate price charged by generic manufacturers, which are obtained from quarterly surveys. A stochastic element is added to the calculations each quarter, to avoid gaming.
Branded and generic competition: brand equalisation

2.97 Generic prescriptions can be filled by either branded or generic versions of the drug prescribed. A number of branded drug manufacturers compete with generics in supplying the pharmacy against a generic prescription.

2.98 One approach, known as brand equalisation, involves the brand manufacturer offering a pharmacy a single blended price for the supply of the branded drug to be dispensed against both branded and generic prescriptions. The blended price may provide the pharmacy with a greater margin than stocking both branded and generic drugs. This is profitable for manufacturers as long as the lower prices are still above the costs of supply. Estimates from the British Generic Manufacturers Association (BGMA) suggest that brand equalisation may account for on average 10 to 15 per cent of the total supply of generic prescriptions.

Conclusion on competition to supply pharmacies

2.99 This section has assessed the nature of competition to supply pharmacies. This will provide a basis for an assessment of the effects of the PPRS and options for reform later on in the report.

2.100 When a drug is reimbursed as a brand (as is the case for reimbursement of on-patent drugs and branded prescriptions), competition is between the branded manufacturer and parallel importers to supply the pharmacy. When a drug is reimbursed as a generic, competition is primarily between generic manufacturers through Scheme M, but may also come from branded suppliers, for example through brand equalisation deals, and, to a lesser extent, parallel importers. In both cases, pharmacies are strongly incentivised to negotiate competitive prices with suppliers, delivering savings to the NHS providing these are picked up through margin analysis.

2.101 However, differences in the method of calculating reimbursement prices between brands and generics mean that the levels of margin earned on dispensing as a brand (at least, for domestically-sourced supply) are much lower than those earned on dispensing as a generic. This can be a source of considerable advantage to branded manufacturers competing with generics, since it allows them to market their products to GPs and PCTs as cheaper than generics and yet still to sell to pharmacies at a higher price. This also increases costs to the NHS.

Hospitals

2.102 Hospitals across the UK purchase their own drugs, negotiating purchase prices that are often below manufacturer’s list or Drug Tariff prices. Hospitals can also control prescribing with more certainty than primary care organisations. Hospital doctors are employees so adherence to formularies, or guidance put out by internal Drugs and Therapeutics Committees, can be made a contractual term of employment.

Incentives to procure drugs

2.103 In general NHS hospitals have sharper incentives to contain drug costs than PCOs and GPs. This is mostly due to how hospitals are funded and is especially true in England, where hospitals compete for business from PCTs in an internal market for healthcare interventions. Under this system of ‘Payment by Results’ (PBR) most services delivered by hospitals are subject to a National Tariff, set according to the average national cost of delivering it, though regional
variations in the costs of inputs such as land and wages do lead to slightly different Tariff prices around the country. Hospitals that cannot deliver services at or below Tariff prices run into deficit. But hospitals that obtain inputs to services more cheaply than the Tariff can make profits over time. The commercial pressure that the Tariff applies is likely to be fairly strong since policy in England appears to be that financially failing hospitals will be allowed to fail.

2.104 Hospitals are not subject to the internal market model elsewhere in the UK. Instead, hospitals negotiate and agree their funding with either their local primary care organisation or central authorities. In Scotland, hospitals are explicitly jointly-funded with Area Health Boards by the Scottish Executive Health Department. In Wales and Northern Ireland, hospitals are still nominally funded by a process of PCOs choosing between them to commission services.

2.105 Despite the differences in their funding, hospitals all around the UK purchase their own inputs and stand to gain directly from doing so, conferring incentives to purchase drugs efficiently. Like pharmacies in primary care, hospitals endeavour to beat a reimbursement system that is based in some way on average costs. The difference is that when hospitals are successful savings accrue directly to the NHS, whereas savings made by pharmacies need to be recovered through the clawback.

**Procurement methods**

2.106 Because clinician compliance with hospital formularies, while variable, is relatively strong, hospitals have a greater potential to exploit buyer power than in primary care. Further, because they realise immediate benefits from purchasing drugs efficiently they have strong incentives to do so. As a result, joint procurement arrangements have sprung up around the UK, between hospitals at local, regional and sometimes national levels.

2.107 In England, the NHS Purchasing and Supplies Agency (PASA) arranges National Framework Agreements for the purchase of generic drugs for hospitals and has begun overseeing 14 regional Pharmacy Service Groups that procure branded drugs. National Framework Agreements are not legally binding contracts but, rather, negotiated templates of terms and conditions serving as the basis for local contracts. They do quote national prices.

2.108 The Pharmacy Service Groups employ variable approaches in comparison. Some concentrate on securing volume discounts for specific branded drugs. Others put out therapeutic tenders to which all suppliers of products relevant to a given clinical intervention are invited to bid, that is, manufacturers, wholesalers and parallel importers of broadly therapeutically substitutable drugs. Procuring brands is more fraught for groups of hospitals than procuring generics because hospitals can disagree on the clinical merit of competing on-patent products which are necessarily different from one another. By comparison, once a decision has been made to go with a particular off-patent chemical it is relatively easy to focus on cost.

2.109 In Wales, Scotland and Northern Ireland, much the same issues are encountered. In Wales, the All-Wales Drugs Contracting Committee (AWDCC) organises centralised tenders for both branded and generic drugs, though Welsh hospitals also make some purchases unilaterally. In Scotland the Scottish Pharmacologistics Group (SPG) and National Procurement Organisation together award national contracts for generic drugs, whilst branded medicines are jointly procured by regional groups of hospitals. In Northern Ireland, the Regional Supplies Service (RSS) contracts on behalf of hospitals for a large number of drugs, both branded and generic.
**Savings in the hospital sector**

2.110 We calculated the discount obtained by hospitals on the fifty drugs on which they spent the most in the calendar year 2005. The data used was provided by PASA from their Pharmex database that has recorded all drugs transactions made by over 150 English hospital trusts since 2003.

2.111 Approximately a third (£550 million) of hospital expenditure on brands in England was spent on the fifty most costly drugs (hospital expenditure on all drugs was £1.6 billion in 2005). The total discount obtained by hospitals on this expenditure (below the price listed in the BNF) was about £77 million (or 12.3 per cent). This is only about two per cent higher than the discount typically secured by a pharmacy on its purchases of branded drugs. Indeed, inasmuch as hospitals purchase direct from manufacturers, this figure is broadly comparable to the 12.5 per cent discount at which manufacturers typically sell branded products to wholesalers. Assuming the same percentage discount is obtained on the remaining drugs, the total value of discounts to hospitals would be approximately £230 million.

2.112 However, there is variation in the discounts obtained across drugs. Various factors might explain this. For example, hospitals’ ability to negotiate discounts (for example through therapeutic tendering) may in part be determined by the therapeutic closeness of available substitutes, as this would be expected to strengthen their bargaining positions.

2.113 In order to examine whether the existence of close therapeutic substitutes is an important factor in determining hospital discounts, we calculated the discounts obtained for eight drugs with no other drugs in the same BNF Paragraph (using BNF Paragraph as a proxy for substitutability of alternative drugs).\(^{21}\) The average discount obtained on these drugs was 9.5 per cent (ranging from three per cent to 11 per cent). The average is thus lower than for the fifty drugs of highest expenditure, and with a smaller range.

2.114 Then we looked at three on-patent drugs (in various forms and pack sizes) used to treat common conditions of the cardiovascular system. As a result, each therapeutic area within the cardiovascular system (statins for cholesterol, calcium-channel blockers for hypertension, etc) has attracted several broadly substitutable products with somewhat distinct chemical action. For data as of early 2005, we found that hospitals achieved discounts to PPRS list price ranging from seven per cent to 37 per cent. This contrast suggests that the existence or not of therapeutic substitutes is important in whether hospitals are able to negotiate favourable deals on drugs.

2.115 One estimate of the savings in the hospital sector comparable to primary care was undertaken by the NAO Wales in 2003. Of particular interest in this report was the finding that, ‘The All Wales Drugs Contracting Committee prices were, on average, 50 per cent lower than those obtained in primary care’.\(^{22}\)

2.116 While we were unable to obtain sufficient data to control simultaneously for all effects relevant to hospital discounts, our results do at least confirm empirically that, by one means or another, hospitals can induce reasonable competition among suppliers when real choices exist. In particular, the closeness of therapeutic substitutes was found to be an important factor in determining the size of discounts, suggesting that hospitals are able to use therapeutic tendering effectively to obtain greater discounts.

---

\(^{21}\) The vast majority of drugs do have substitutes in the same Paragraph (48 out of the top 50 by hospital expenditure).

\(^{22}\) The report also notes that, ‘Only a minority of primary care medicines are covered by All Wales Drugs Contracting Committee prices: some 500 out of 14,000 items.’ Source: ‘The procurement of primary care medicines’ – Report by the national Audit Office Wales on behalf of the Auditor General for Wales, March 2003.
Conclusion

2.117 The PPRS is best thought of as a means of exercising buyer power in the purchase of prescription pharmaceuticals across the NHS. A strong justification for some form of UK-wide pricing scheme is the need to ensure money spent on prescription drugs represents value for money. While there is variation at a local level, prescribers in primary care generally demonstrate low price sensitivity. Under current arrangements, some products with very close clinical effects but wide disparities in price achieve high prescribing volumes, raising a major question as to whether value for money is being secured.

2.118 In relation to competition to supply pharmacies, very different methods are used to set reimbursement prices for brands (PPRS) and generics (a variety of mechanisms but predominantly Scheme M). In both cases, pharmacies are strongly incentivised to negotiate competitive prices with suppliers, delivering savings to the NHS providing these are picked up through margin analysis. However, these methods allow pharmacies to secure much higher margins on generics than on brands. Where off-patent brands are in competition with generics, this is a source for concern, since it gives branded manufacturers a strong competitive advantage, allowing them to market their products to GPs and PCOs as cheaper than generics and yet still to sell to pharmacies at a much higher price.

2.119 We explore potential options to address these concerns in Chapter 5.
3 DRUG PRICES AND GLOBAL INVESTMENT INCENTIVES

Introduction

3.1 This Chapter considers UK pharmaceutical prices in a global context. Its main purpose is to consider to what extent UK prices – and hence a UK pricing scheme – can affect incentives to invest in pharmaceuticals.

3.2 It begins with a global overview of the pharmaceutical sector, before reviewing available evidence on the cost structure of pharmaceuticals – in particular considering what proportion of costs are international, in the sense that they can be incurred anywhere in the world for supply to a particular country. This provides a basis for considering the two central questions of this Chapter:

- whether UK prices can affect incentives to invest in drugs, and
- whether UK prices can have an effect on the location of internationally mobile pharmaceutical investments and, in particular, be used to attract such investments to the UK.

3.3 The first question unambiguously relates to one of the central objectives of the PPRS. Some stakeholders also regard the second as one of the scheme’s implicit aims, although there is disagreement over this point. Finally, a brief comparison is made of UK drug prices and those in other countries, before conclusions are drawn.

3.4 More detailed analysis of the issues addressed in this chapter is provided in Annexes D, E and F.

Global overview of pharmaceuticals

3.5 Pharmaceuticals is a global business. This section provides a brief overview of global expenditure by country and by product and describes the various stages of a drug’s lifecycle, before reviewing available evidence on the cost structure of pharmaceuticals.

Global expenditure

3.6 IMS estimates suggest that 2005 global pharmaceutical sales totalled US $602 billion, a growth of seven per cent from the previous year (sales US $ 550 billion). As shown in Figure 3.1 below, the market has grown rapidly in recent years, with growth rates varying between seven and twelve per cent per annum. Total sales are projected by IMS to continue to grow between five and eight per cent over the next few years.

3.7 These figures include sales of both branded drugs and generics. Brands continue to account for the bulk of global sales by value.
Figure 3.1: Global pharmaceutical sales (US $billion)

Source: IMS, ‘Global Pharmaceutical Perspectives 2005’, IMS Health Total Market Estimates and Global Pharma Forecasts (total sales include IMS audited figures and IMS estimates for unaudited markets);

3.8 Figure 3.2 below shows global sales in 2005, broken down by world regions. North America accounts for the largest proportion of the world market (46.8 per cent). The UK on its own accounts for circa 3.45 per cent of world pharmaceutical sales, down from an estimated 3.9 per cent in 2004. Europe as a total (including the UK and Germany) accounts for 30.6 per cent of total sales.

Figure 3.2: Breakdown of pharmaceutical sales by value by region in 2005

Source: IMS, ‘Global Pharmaceutical Perspectives 2005’ (world audited market) and OFT calculations.\(^{23}\)

\(^{23}\) Rest of Europe (all other European Countries except the UK and Germany)
3.9 Figure 3.2 shows that the UK accounts for less than four per cent of global pharmaceutical sales. It might be inferred from this that UK pricing policy can have only very limited effects on the pharmaceutical industry as a whole. However, as discussed in more detail below, this is not the case.

3.10 Table 3.1 shows the top ten brands and the top ten therapeutic classes by global sales in 2005. The best-selling products are those which treat chronic conditions, where the patient takes medicine on an ongoing basis. The best-selling drugs in 2005 were Lipitor and Plavix, the first treating high levels of cholesterol, and the second preventing heart attacks and strokes by targeting blood platelets. The two biggest selling drugs in 2004 were Lipitor and Zocor, both of which are cholesterol-reducing drugs. The patent of Zocor has now expired in most countries.

Table 3.1: The top ten brands by global pharmaceutical sales 2005 and 2004

<table>
<thead>
<tr>
<th>Leading brands (2005)</th>
<th>Type of drug</th>
<th>Global Sales 2005</th>
<th>Global Sales 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Lipitor (atorvastatin)</td>
<td>Cholesterol-regulating drug</td>
<td>12.9 2.3</td>
<td>12.0 2.3</td>
</tr>
<tr>
<td>2 Plavix (clopidogrel)</td>
<td>Antiplatelet drug</td>
<td>5.9 1.0</td>
<td>5.0 1.0</td>
</tr>
<tr>
<td>3 Nexium (esomeprazole)</td>
<td>Ulcer-healing drug</td>
<td>5.7 1.0</td>
<td>4.8 0.9</td>
</tr>
<tr>
<td>4 Seretide/Advair (fluticasone+salmeterol)</td>
<td>Bronchodilator/corticosteroid</td>
<td>5.6 1.0</td>
<td>4.7 0.9</td>
</tr>
<tr>
<td>5 Zocor (simvastatin)</td>
<td>Cholesterol-regulating drug</td>
<td>5.3 0.9</td>
<td>5.9 1.1</td>
</tr>
<tr>
<td>6 Norvasc (amlodipine)</td>
<td>Calcium-channel blocker</td>
<td>5.0 0.9</td>
<td>4.8 0.9</td>
</tr>
<tr>
<td>7 Zyprexa (olanzapine)</td>
<td>Antipsychotic drug</td>
<td>4.7 0.8</td>
<td>4.8 0.9</td>
</tr>
<tr>
<td>8 Risperdal (risperidone)</td>
<td>Antipsychotic drug</td>
<td>4.0 0.7</td>
<td>– –</td>
</tr>
<tr>
<td>9 Ogastro/Prevacid (lansoprazole)</td>
<td>Ulcer-healing drug</td>
<td>4.0 0.7</td>
<td>3.8 0.7</td>
</tr>
<tr>
<td>10 Effexor (venlafaxine)</td>
<td>Antidepressant drug</td>
<td>3.8 0.7</td>
<td>3.7 0.7</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>Leading ten Brands</strong></td>
<td><strong>$56.9 10.1</strong></td>
<td><strong>$53.6 10.3</strong></td>
</tr>
</tbody>
</table>

Source: IMS, ‘Global Pharmaceutical Perspectives 2005 and 2004’

3.11 In 2005, 30 new chemical entities (NCE) were launched globally (compared with 30 in 2003 and 31 in 2004). Annual launches have remained around this figure since 2000, but this represents a significant fall from the 1990s, which saw between 35 and 50 NCE launches per year.
3.12 The diagram below presents a schematic overview of the drug production process, from basic discovery to generic entry after patent expiry. Box 3.1 contains a brief description of the key stages.

**Box 3.1: Stages in the lifecycle of a drug**

1. Basic research is sometimes conducted within public sector institutions such as universities.
2. Pharmaceutical companies can acquire patent protection once basic research has led to the identification of promising New Molecular Entities (NMEs).
3. Pre-clinical trials precede any testing on humans, and involve rigorous testing of selected NMEs in laboratories and animals. Less than one per cent of compounds successfully make the transition from pre-clinical to clinical trials.
4. Clinical trials are carried out in humans. Three stages of trials are carried out before drugs can receive marketing authorisation. An estimated 21.5 per cent of drugs successfully pass through clinical trials. The different stages are:
   - Phase I trials in 20-100 healthy adults to test the drug’s safety;
   - Phase II trials in 100-300 patient volunteers to determine the safety and efficacy of the drug;
   - Phase III trials on larger groups of patients (typically 1,000–3,000), to gain further data on safety and efficacy;
5. Marketing authorisation must then be obtained before drugs can be launched onto the market;
6. After drugs reach the market, Phase IV pharmaco-vigilance trials begin. These seek to identify any adverse drug reactions and continue throughout a drug’s lifetime.
7. Generic manufacturers are able to enter the market and sell generic copies of the drug after a drug’s patent (and any supplementary protection certificate) has expired.
Cost structure of the pharmaceutical industry

3.13 The costs involved in developing, producing and marketing a drug can be categorised according to where they are incurred and whether they vary with the volume of sales and / or the countries in which the drugs are sold.

- **R&D** is an international activity in the sense that it can be located wherever a suitable research environment exists. Moreover, once a drug has been developed, the R&D cost does not need to be incurred again to make the drug available in other countries (R&D is a ‘globally common cost’)

- **Manufacturing** also can be located anywhere in the world (although some transport costs are involved in getting products to different markets around the world) and economies of scale usually mean that manufacturing of each drug is in fact concentrated in a small number of locations in the world. Selling a drug in an additional market causes some additional manufacturing costs to be incurred – for example the variable costs of materials and labour, and

- the remaining costs are mostly incurred in the country of sale and are specific to the country in which they are carried out. These include some **distribution costs and the costs associated with marketing** and other activities (including interactions with government pricing and reimbursement agencies).

R&D costs

3.14 The costs of R&D per approved drug have risen considerably over the past 30 years. This partly reflects increasing overall expenditure on R&D and partly the decline in the number of NCEs receiving approval over the period. DiMasi et al (2003)²⁴ calculated R&D costs for a sample of 68 drugs first tested on humans between 1983 and 1994. According to their estimates, the capitalised value of R&D expenditure in 2000 averaged $802 million per approved new drug.

3.15 Global year on year R&D expenditure currently averages about 16 per cent of sales. However, this investment takes place years in advance of sales being generated, imposing financing costs on the company in the intervening period. Therefore R&D represents a significantly higher proportion of the economic costs of pharmaceutical companies. Estimates of proportion of economic costs accounted for by R&D range between about 30 and 40 per cent.²⁵

Overall cost breakdown

3.16 Reinhardt (2001)²⁶ suggests that manufacturing costs represent about 27 per cent of sales value and that sales, general and administrative costs account for some 35 per cent. As noted above, this latter component of costs can be considered primarily national in scope.

---

²⁵ Annexe D provides further details.
3.17 Analysis we have undertaken (from companies’ annual financial returns (AFRs) to DH under the PPRS) of costs incurred in the UK provide some support for these estimates. These suggest total sales promotion and information costs in the UK average about 18 per cent of sales value, distribution costs average about three per cent and general and administrative costs about 12 per cent of sales value (see Annexe H).

3.18 Based on the evidence quoted in Annexe D, our broad brush estimate of the cost structure of the pharmaceutical industry suggests that of the order of 65 to 70 per cent of economic costs are internationally mobile (35 per cent R&D and 30 to 35 per cent manufacturing and other) with around 30 to 35 per cent national in scope. This fact is important understanding the potential significance of UK pharmaceutical prices on global investment decisions. We assess this issue in the next section.

Impact of UK prices on incentives to invest

3.19 This section considers to what extent prices in the UK can have an effect on investment in the pharmaceutical sector. We address two distinct issues: whether UK prices can affect incentives to invest in new drugs in the future; and whether UK prices affect incentives to locate investments in the UK.

Incentives to invest in drugs

3.20 The PPRS sets out not just to deliver reasonable prices to the UK but to allow sustained investment in drugs for the future. A key question here is whether pharmaceutical prices in the UK can have any effect on the incentives of companies to invest in certain drugs. As noted above, the costs of R&D (and certain global manufacturing facilities) can be characterised as global common costs. It is not therefore clear to what extent incentives to incur such costs are affected by revenues in any country that represents a relatively small proportion of global demand. There may be some scope for such countries not to remunerate these costs, thus ‘free riding’ on the prices paid by other countries.

3.21 Pharmaceutical prices in the UK will obviously have a direct effect on the revenues that companies earn from UK sales. However, this effect is likely to be relatively small in a global context, because the UK market represents less than four per cent of global sales.

3.22 However, some countries base their prices, in part or in full, on prices in other countries (this is known as ‘international reference pricing’). As a result of international reference pricing, a country to which other countries link their prices will have a greater effect on global returns to R&D than the size of that country’s pharmaceutical market would suggest. The UK has a particularly important effect in this respect. We have found that:

- countries which reference pharmaceutical prices to the UK include Japan, France, Italy, Canada, Belgium, Switzerland, Poland, Netherlands, Finland, Hungary, Norway and Ireland, and

- together, these markets account for around 25 per cent of world pharmaceuticals sales. However, not all products in these countries are referenced to the UK. The importance of international referencing pricing in the overall pricing regime varies between these countries, as does the number of countries included in each nation’s reference basket. Annexe K provides further details.
3.23 The figure below shows the importance of the UK as a country to which others reference their prices. UK prices may have further ‘ripple’ effects as a result of other countries which do not reference directly to the UK but do reference to one of the above countries. This can also be observed in the diagram.

**Figure 3.4: Overview of countries that reference to the UK**

![Diagram showing reference of countries to the UK](image)

Source: Internal OFT Analysis

3.24 We have also heard that UK prices – and the assessments of expert bodies such as NICE – are often used informally in price negotiations around the world, even where they are not used in formal reference price schemes.

3.25 To conclude, the impact that UK prices have on global returns to R&D is likely to be significant, despite the relatively low proportion of global sales generated in the UK. Given this importance we believe that a UK pricing scheme can and should take into account the effect that the prices it sets have on global investment incentives. In particular, as discussed later in this report, it is our view that the UK has a significant opportunity, through the PPRS, to provide incentives to invest in areas of the greatest clinical need.
Incentives to locate investment in the UK

3.26 Internationally mobile investments such as R&D and some manufacturing investments are also important from an ‘industrial policy’ perspective. For a variety of reasons – such as the spillover effects R&D may have on other sectors and its consequent contribution to economic growth – many governments seek to encourage companies to locate these investments within their national boundaries, and use a range of industrial policy instruments in an attempt to do so.

3.27 Some stakeholders regard the PPRS as an important component of the UK Government’s industrial policy towards the pharmaceutical industry – that is, as a means of attracting and retaining pharmaceutical R&D and other internationally mobile investments within the UK. While major stakeholders disagree over whether this is one of the scheme’s aims, it is important to assess whether the PPRS does achieve such objectives in practice.

Rationale for attracting pharmaceutical investment in the UK

3.28 The industrial policy of the UK Government (and indeed other governments) focusses on attracting and retaining investment in the international (and therefore ‘footloose’) component of the supply chain. This was part of the rationale behind the creation of the Pharmaceutical Industry Competitiveness Taskforce (PICTF), which is now known as the Ministerial Industry Strategy Group (MISG).

3.29 Consistent with this goal, the UK Government announced in 2004 that it was setting a new target for attracting R&D into the UK across the whole economy

“... because we want Britain to be the most attractive location in the world for science and innovation, we are setting a new and ambitious target of increasing UK R&D investment as a proportion of national income from its current level of 1.9 per cent to 2.5 per cent by 2014 over the next decade.”

3.30 Of the various potential economic rationales for attracting R&D in the UK, the most plausible are those that are based on geographical spillovers – that is, benefits from R&D that accrue to other companies located near the investment in question. Other potential justifications are less compelling and, in some cases, are based on a conflation of the aim of attracting investment in the UK with that of supporting UK-owned firms, whether located in the UK or not.

3.31 A previous attempt to quantify these benefits – conducted for PICTF in 2000 – suggested R&D spillovers and labour rents could reach up to £520m. It also suggested that there is a potential terms of trade effect of between £1 and £2bn, although this figure is a significant overestimate as it takes no account of offsetting effects – namely the fact that resources currently allocated to the pharmaceutical sector would be used elsewhere to produce exportable goods or to replace imported goods. We think there would be merit in revisiting some of the calculations in light of more recent data and the considerations set out in the present report.


28 Such a goal is not, to our knowledge, consistent with current Government policy. Further, the global nature of share ownership means that it would be unclear to what extent any individual firm is solely or even mainly owned by UK citizens.
UK success in attracting pharmaceutical R&D investment

3.32 The figure below shows total Business Expenditure on R&D (BERD) as a percentage of GDP across several countries for 2002 and 2003 (the most recent years for which data were available). Against this measure, the UK was the fourth most successful country in attracting pharmaceutical R&D investment in the world.

3.33 In 2002 pharmaceutical industry business expenditure on R&D accounted for 0.33 per cent of GDP in the UK. This compares with Sweden (0.61 per cent), Denmark (0.4 per cent) and Belgium (0.39 per cent). Notably, the UK is the highest performing of the larger economies, ahead of France and Japan (both 0.19 per cent), the US (0.14 per cent) and Germany (0.13 per cent).

3.34 The important question from a policy perspective is which factors help to explain the ability of the UK to attract and retain investment.

Figure 3.5: Pharmaceutical BERD as a percentage of GDP, 2002/2003

Source: OECD (Figures relate to 2002 unless otherwise stated)

Does PPRS attract investment into the UK?

3.35 Our analysis of the workings of the profit cap element of the PPRS has shown that, contrary to widespread perceptions, the scheme does not contain any systematic incentives to locate investments within the UK.

3.36 The R&D allowances provided for under the scheme can, in principle, relate to R&D investment anywhere in the world. The allowances, therefore, provide no incentive to locate R&D investments in the UK. Strikingly, in discussions with the OFT, some scheme members seemed to believe that R&D allowances were only available for R&D undertaken in the UK. These tended, however, to be large firms for whom R&D investment in the UK alone
exceeded their maximum R&D allowance under the scheme. Firms that were reliant on R&D undertaken outside the UK to claim their allowance were more aware of the rules.

3.37 Other stakeholders suggested to us that the calculation of allowed rates of return and the determination of the capital base under PPRS give an incentive to invest in the UK rather than elsewhere. While the analysis here is more complex (Annexe E provides details) our conclusion again is that there are no systematic incentives within the scheme to locate investments within the UK, largely because of the advantages companies secure from transfer pricing under the scheme.

3.38 If anything, PPRS rules are more favourable to companies importing from their affiliates abroad since they are unconstrained by the profit ceiling if, as most do, they base transfer prices on the resale-minus methodology. If there were a material possibility of UK companies being constrained by the profit ceiling, the rules might even deter investment in the UK. In practice, we do not believe UK investment has been deterred since the PPRS profit constraint on companies has been minimal in recent years, as discussed in the following Chapter.

Legal constraints

3.39 We have noted that the current scheme does not provide explicit incentives to invest in the UK. There are, in addition, strong arguments to suggest that the scheme could not be amended to provide any such incentives in the future, as this would be contrary to EC rules on the free movement of goods and State Aid rules (Articles 28 and 87 of the EC Treaty).

3.40 In a number of cases, Member States’ pharmaceutical price regulation measures were held to breach Article 28 (with no justification under Article 30) on the basis that they favoured domestic supplies over imported products. For example, in the late 1980s Italy adopted a method of fixing prices for pharmaceutical products which expressly provided that:

- the development of the national industry and research on the national territory should be promoted, and
- the cost components related thereto may be taken into account to a greater extent than the corresponding cost components for imported products.

3.41 Under these terms the supplementary costs and charges inherent in importation were not mentioned among the factors to be taken into consideration in the fixing of prices of imported products. The ECJ held that this constituted a measure having an effect equivalent to quantitative restrictions on imports within the meaning of Article 28. This and other relevant cases are discussed in Annexe D.

Drivers of location of R&D investment

3.42 We met a number of companies in a variety of countries to discuss the sorts of factors that drive the location of pharmaceutical investments. Factors that we found to have the most important effect on the location of R&D investment include:

- a highly skilled workforce with relevant scientific qualifications
- the presence of opinion leaders in the medical field
- access to high quality clinical trials infrastructure
- existing R&D activity, including public sector R&D, and
- historical and cultural factors.

29 Commission v Italy (Case 56/87, [1988] ECR 2919).
Financial factors, such as labour costs, taxation rates and tax credits, also have an impact but are generally held by industry to be of secondary importance to the ‘quality’ of the investment environment (that is, to be determinative only when countries are equally attractive on quality grounds).

The UK performs particularly well against many factors relating to the quality of the investment environment, enjoying large numbers of highly qualified scientists and, perhaps most importantly, highly regarded experts in the medical or pharmaceutical fields – or ‘opinion leaders’ – who are key to encouraging companies to conduct clinical trials in the UK. Through spillover effects, public expenditure on R&D can also help attract private investment. Here again, the UK performs impressively: the proportion of GDP spent on public health R&D in the UK is the second highest in the world (after the US). The recent Cooksey Review\(^{30}\) has made recommendations for how a new single fund for health research – worth an estimated £1bn – might be operated in the future.

These and other factors discussed in Annexe E help explain the UK’s success to date in attracting private sector R&D expenditure. Some companies also suggested to us that ‘market conditions’ were important in determining where investments will take place. However, it is not clear to us how there can be an explicit link. By definition, the revenues companies receive from the sales of products in a particular market are not a driver of internationally mobile investments – only of market specific expenditure such as marketing – since companies are not required to invest in a particular country to receive revenues from selling a particular product.\(^{31}\)

In response, it has been suggested to us that there is an indirect link between price and the location of investment, since companies will use the threat of withdrawing investments as a means of persuading governments to maintain high prices. It is rational for companies to make such threats in an attempt to make features of the policy environment – such as pricing and reimbursement decisions – more favourable. It is not clear, however, that these threats are always credible, particularly if the country in question performs strongly in relation to the drivers identified above. We could find no clear relationship between price level and success in attracting R&D investment.

Overall, our findings are consistent with the high level conclusions of a forthcoming report jointly commissioned by UKTI and ABPI under the auspices of the Ministerial Industry Strategy Group (MISG)\(^{32}\) which reported:

“\(\text{In general, we did not find credible economic mechanisms to suggest that product market characteristics were of over-riding importance when making investment decisions. Firms should locate research and manufacturing in the best and most cost-efficient locations, then market their products globally.}\)"

The NERA report went on to say,

“\(\text{However, we found that firms often have a number of alternative locations for investment assets that are broadly equal in other dimensions, and in these situations market conditions can be an influence on the ultimate choice.}\)"

We are not convinced of this argument but consider its implications at the end of this chapter.

---

\(^{30}\) A Review of UK Health Research Funding (2006), Sir David Cooksey December 2006.

\(^{31}\) There is one component of R&D for which it could be argued that decisions over where to locate are related in part to market conditions. The location of clinical trials may in part be driven by a desire to market a product to clinicians in a particular country so as to improve subsequent uptake.

\(^{32}\) NERA (Forthcoming 2007), 'Key Factors in Attracting Internationally Mobile Investments by the Research-Based Pharmaceutical Industry', a report commissioned by UKTI and ABPI and presented to the MISG. Henceforth referred to as ‘the NERA report’.
Conclusion on UK prices and investment incentives

3.49 We find that there is very little evidence to link the price of pharmaceuticals in the UK with the overall attractiveness of the UK as a location for pharmaceutical R&D investment. This does not mean that overall pharmaceutical prices should be pushed down as low as possible. R&D investment in valuable drugs should be appropriately rewarded to provide the right incentives for companies to continue investing in useful products in the future. The PPRS is in a strong position to do this, since so many countries reference their prices to those in the UK.

3.50 We would argue that the scheme should be designed to improve the incentives it gives for productive investment. This is discussed in Chapter 5. We are also clear that any future reform of the PPRS must retain the current policy of not discriminating between firms on the basis of the location of their investments. Indeed, this policy should perhaps be made more explicit as several companies and public bodies we spoke to on our international case studies seemed to think that the scheme is currently used – explicitly or implicitly – to favour UK-based firms. Such perceptions are unhelpful: for companies they risk undermining stability and transparency; and internationally, they may help to legitimise potential discriminatory behaviour by other players in the future.

3.51 We note that moves towards clarifying these issues would be consonant with the Health Select Committee’s recommendations to remove industry sponsorship objectives from the Department of Health’s pharmaceutical regulatory and policy functions.

3.52 The most effective means available to Government for attracting investment into the UK is to invest in the explicit factors identified above that have a direct effect on the attractiveness of the UK as a location for investment, such as investing in the scientific skill base or improving the environment for clinical trials. Examples of initiatives that do this, such as the creation of the UK Clinical Research Collaboration, are to be welcomed.

International comparison of drug prices

3.53 This section provides a brief assessment of how the prices of branded pharmaceuticals in the UK compare with those in other countries. As discussed below, there are many methodological challenges to be faced in constructing international comparisons. Further, even if these can be addressed it is not always clear what policy conclusions can be drawn from such comparisons, since so many different factors drive outcomes. Comparisons therefore need to be embedded in a detailed understanding of the policy and market environment in the countries to which they refer. We would advise against drawing simplistic inferences from the data alone in the absence of such understanding.

3.54 Nevertheless, political interest tends inevitably to focus on international comparisons, particularly of drug prices. The analysis here therefore presents an overview of estimates that have been carried out and comments where appropriate on problems in interpreting the data and adjustments that, in our view, should be carried out.

Methodological issues

3.55 Conducting international price comparisons requires a number of different issues to be addressed, regarding, for example, the types of drugs and numbers of countries covered and the use of exchange rates. Some of these issues are summarised in the table opposite.
<table>
<thead>
<tr>
<th><strong>Table 3.2: Factors which can affect international price comparisons</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Decisions about what prices should be compared</strong></td>
</tr>
<tr>
<td>Comparator countries</td>
</tr>
<tr>
<td>Type of drugs covered</td>
</tr>
<tr>
<td>Prices at different points in the supply chain</td>
</tr>
<tr>
<td>- ex-manufacturer price</td>
</tr>
<tr>
<td>- wholesale price (i.e. the price paid by pharmacies purchasing from wholesalers), and</td>
</tr>
<tr>
<td>- the ‘public price’ (i.e. the cost to the public purse) net or gross of tax.</td>
</tr>
<tr>
<td>Point in time</td>
</tr>
<tr>
<td><strong>The price data used to make the comparison</strong></td>
</tr>
<tr>
<td>Sample</td>
</tr>
<tr>
<td>Adjustments for discounts/rebates</td>
</tr>
<tr>
<td>Sectoral coverage</td>
</tr>
<tr>
<td><strong>The methodology used to make the comparison</strong></td>
</tr>
<tr>
<td>Bilateral versus multilateral</td>
</tr>
<tr>
<td>Matching criteria</td>
</tr>
<tr>
<td><strong>The parameters used in constructing overall price indexes</strong></td>
</tr>
<tr>
<td>Volume weights</td>
</tr>
<tr>
<td>Exchange rates</td>
</tr>
<tr>
<td>- market exchange rates, either at a given point in time or averaged over a suitable period, and</td>
</tr>
<tr>
<td>- estimates of Purchasing Power Parity (PPP) or Equilibrium Exchange Rates (EER).</td>
</tr>
</tbody>
</table>

3.56 Annexe E contains a more detailed assessment of the issues. In the next section we consider price comparisons that have been conducted by DH aiming to establish whether UK branded prices are relatively high or low in relation to those prevailing in a selection of comparator countries.

**DH comparisons**

3.57 The Department of Health undertakes its own international price comparisons on an annual basis and results are regularly presented in its reports to parliament. The most recently published is the *Pharmaceutical Price Regulation Scheme: Ninth Report to Parliament: July 2006*. The results compare branded medicines in the UK with a range of European countries and the USA. To quote the DH report about the annual comparison exercise:

“It compares the prices of all preparations for the top 150 branded medicines in the UK with other countries, depending on the availability of matching preparations elsewhere”.

3.58 In broad terms, we believe DH methodology for comparing prices is a sensible and pragmatic approach to the problem. It generally avoids reliance on the more speculative and hence potentially contentious methodologies, relying, for example, on historical exchange rates rather than projected equilibrium exchange rates and only on exact presentation matches rather than some form of weighted average per molecule. This can be at the expense of generalisability so, as always, care should be taken not to draw broader conclusions than the results warrant. One area future comparisons might, in our view, usefully explore further would be the use of rebate systems in a number of countries. As discussed below, this can have an important effect on the results.

3.59 The table below presents the following bilateral comparisons of ex-manufacturer prices, reproduced with DH permission. Results for 2005 are not yet published by DH and have been provided directly to OFT by DH. They remain provisional at this time.

<table>
<thead>
<tr>
<th>Country</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>84</td>
<td>80</td>
<td>81</td>
<td>81</td>
<td>91</td>
<td>84</td>
<td>96</td>
</tr>
<tr>
<td>Germany</td>
<td>97</td>
<td>91</td>
<td>94</td>
<td>95</td>
<td>102</td>
<td>106</td>
<td>108</td>
</tr>
<tr>
<td>Italy</td>
<td>83</td>
<td>79</td>
<td>82</td>
<td>86</td>
<td>90</td>
<td>78</td>
<td>84</td>
</tr>
<tr>
<td>Netherlands</td>
<td>n/a</td>
<td>81</td>
<td>84</td>
<td>88</td>
<td>93</td>
<td>92</td>
<td>95</td>
</tr>
<tr>
<td>Spain</td>
<td>67</td>
<td>64</td>
<td>67</td>
<td>75</td>
<td>81</td>
<td>80</td>
<td>84</td>
</tr>
<tr>
<td>USA</td>
<td>184</td>
<td>209</td>
<td>217</td>
<td>201</td>
<td>190</td>
<td>176</td>
<td>198</td>
</tr>
<tr>
<td>Austria</td>
<td>83</td>
<td>77</td>
<td>81</td>
<td>83</td>
<td>94</td>
<td>94</td>
<td>96</td>
</tr>
<tr>
<td>Belgium</td>
<td>84</td>
<td>78</td>
<td>81</td>
<td>86</td>
<td>91</td>
<td>90</td>
<td>95</td>
</tr>
<tr>
<td>Finland</td>
<td>85</td>
<td>83</td>
<td>84</td>
<td>88</td>
<td>98</td>
<td>96</td>
<td>101</td>
</tr>
<tr>
<td>Ireland</td>
<td>88</td>
<td>83</td>
<td>88</td>
<td>93</td>
<td>n/a</td>
<td>99</td>
<td>103</td>
</tr>
<tr>
<td>UK</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: DH, 9th Report to Parliament and unpublished data from DH.

34 In relation to the results for various bilateral comparisons the market coverage for the 2003 analysis is reported to range between 29 per cent and 39 per cent of expenditure in England on branded medicines, with a median coverage of 34 per cent.
The position of the EU countries alone is shown in the graph below.

**Figure 3.6: Bilateral comparisons of ex-manufacturer prices in EU countries**

Table 3.3 shows that prices in the US have consistently been much higher than those in any other country. Before 2005, UK prices were consistently higher than those in all European countries with the exception of Germany, in some cases appreciably so. In 2005, the imposition of the seven per cent price cut led to a realignment, with UK prices now the fourth highest among the ten European countries assessed, behind Germany, Finland and Ireland. As noted in Chapter 4, we would expect the effect of the price cut to be strongest in the year in which it is introduced. Therefore it is not clear whether this is a temporary or more systematic realignment of prices.

However, it is important to note that the results shown in the table do not take account of rebates paid by manufacturers in some countries as part of cost containment policies. This means that prices in countries where rebates are imposed will be overstated.

As a result of our contact with payers in the countries concerned (see Annexe K) we found evidence that several countries apply ex post rebates. Some countries impose rebates for different drugs categories paid by public bodies; others enter into price-volume agreements with manufacturers that are effectively ex post rebates for the public payer. These rebates lead to buyers paying less than the price data alone would suggest.

Rebates are significant in three of the four countries that are shown as more expensive than the UK in the above table. We found, for example, that rebates are between two and seven per cent of total expenditure on drugs in Germany, three and a half per cent in Ireland, about three per cent in France and up to 30 per cent off list prices for the United States. Other countries known to use rebate schemes are Austria and Australia. The existence of further arrangements in other countries cannot be discounted.
3.65 A very recent (and unpublished) study by Panos Kanavos et al.\textsuperscript{35} investigates pharmaceutical rebates in the United States and comes to the conclusion that ‘US public prices are comparable to and in many cases, lower than, prices in a number of European countries’. The results of the study show that there is a large discrepancy in the United States between list prices and the prices that are actually reimbursed by health insurance organisations. In certain drug classes rebates seem to range between 32 per cent and 47 per cent, in other drug classes between 13 and 23 per cent (of list price). Across all therapeutic categories the study finds an average discount of 32 per cent, reaching 39 per cent if weighted by volumes. The study also shows that reimbursement prices in the United States (public prices) may be in the same range as Germany and the UK. A price index comparison even finds that prices in the United States are lower than in Germany and just higher than that of the UK (please refer to Annexe F for more details).

3.66 For the UK, in contrast, the ex-manufacturer prices shown in the table – calculated at list price minus 12.5 per cent – seem a broadly fair reflection of ex-manufacturer prices in practice, as discussed in Chapter 2. Were the profit cap leads to significant levels of repayment, a similar need for adjustment would arise. However, as discussed in the next Chapter, this is not the case.

3.67 Taking into account rebates, prices paid at ex-manufacturer level are likely to be broadly comparable with those in Ireland and much closer to those in Germany than is apparent from the table.

3.68 We have also explored, on an indicative basis, the possible effects of volume weightings on the overall results. The assessment provides some support for the view that the UK appears less expensive in the table than it would if the volume weights of the comparator country were used.

**Conclusion**

3.69 In conclusion, we have shown that UK prices have an important influence on incentives to invest in drugs. We believe that a UK pricing scheme should aim to exercise this influence by encouraging companies to invest in drugs that will have the greatest clinical benefit for patients.

3.70 We strongly disagree with any suggestion that a UK pricing regime should be used to favour companies that undertake investments in the UK. Not only would such a policy be contrary to EC legislation, it would also not be an efficient use of Government resources. Other instruments available to Government, by targeting the attractiveness of the investment environment directly, are likely to be much more effective in attracting investment into the UK.

3.71 It is important to reiterate, however, that the focus of this study is not on whether the aggregate level of prices or overall amount spent on drugs in the UK is too high. That is a matter for Government to consider, taking into account broader policy considerations such as the desire to make a fair contribution to the global costs of R&D. Our argument, as suggested in Chapter 2 and explored further in Chapter 4, is very different. We would question whether current pricing arrangements ensure that the best use is made of current

\textsuperscript{35} Panos Kanavos, Joan Cost-Font and Bengt Jönsson, ‘Explaining Cross-County Drug Price Differences: What is the value of innovation, forthcoming;
expenditure on drugs. An alternative value-based approach offers the prospect of delivering
greater benefits to patients for the same level of expenditure, thereby improving value for
money and giving better rewards to companies to invest in the most valuable drugs.

3.72 Such reform would create winners and losers. Therefore – although we are not convinced of
the argument – if there is a loose link between market conditions and incentives to invest in
the UK, reform in the direction of value-based pricing should attract investment by innovative
companies, who would prosper under new arrangements, just as much as it would reduce
the attraction of the UK for those companies who would not.
4 EVALUATION OF CURRENT PRICING AND REIMBURSEMENT ARRANGEMENTS

Introduction

4.1 The previous two Chapters set out the role of the PPRS in terms of delivering value for money and providing companies with the right incentives to invest in drugs. This Chapter aims to assess to what extent the PPRS meets these objectives in practice.

4.2 We first present a high-level assessment of PPRS profit and price controls, in each case summarising the main provisions and assessing their effects. We then develop some general conclusions about the scheme as a whole, the most important of which in our view relates to the fact that there are no mechanisms within it to help ensure prices reflect the value of drugs produced by companies. Since they are clearly relevant to any assessment of mechanisms for ensuring prices are value-reflective, we also refer to analysis we have conducted into NICE, SMC and AWMSG.

4.3 Before assessing the individual controls, we should make some comments about the administration of the scheme. The PPRS is light on direct public administration costs. The PPRS team at DH is highly competent and professional, and operates a very complex scheme with minimal resources. A team of around ten people operate the entire scheme and are also involved in other key aspects of pharmaceuticals policy such as the negotiation of the Pharmacy contract.36

Profit controls

4.4 The PPRS profit controls are generally considered to be the defining feature of the scheme. However, few stakeholders have a detailed understanding of how they work or what their effects are likely to be in practice. In discussions, we encountered a variety of views about the regulation of profitability under the scheme that were not borne out in practice.

4.5 The purpose of this section is to shed some light on these issues. It first provides a brief description of the controls and then considers the difficulties of profit regulation in the pharmaceutical sector. The section continues with a brief analysis of the incentive properties of PPRS controls and the extent to which the controls are binding in practice. Finally, conclusions are drawn. As noted, the details of the controls are complex and can only be touched on here. A more in-depth assessment is given in Annexe H.

Description of main provisions

4.6 The PPRS profit control sets a maximum level for the profits that PPRS member companies may earn from supplying branded drugs to the NHS. The PPRS profit control also sets a lower threshold for profits, such that if profits fall below this lower threshold, companies may increase prices.37

---

36 In comparison, OFWAT, the regulator of the water and sewerage sector (which has an annual turnover of roughly £7 billion – somewhat less than the branded drugs bill) employs just under 200 full-time staff.

37 In this Chapter, we describe this lower threshold as a profit minimum, although it should be noted that this is not an absolute minimum for profits since any increase in profitability for a company that falls below the threshold is, of course, contingent on sales being generated in practice.
4.7 The maximum and minimum level of profits are based on a target rate of return, which is the higher of 21 per cent return on capital employed (ROC) and six per cent return on sales to the NHS (ROS).38

4.8 Each company’s maximum profit is set at 140 per cent of target (target plus a margin of tolerance (MOT) of 40 per cent): the higher of 29.4 per cent of capital or 8.4 per cent of sales. Each company’s minimum profit is set at 40 per cent of target (target less a MOT of 60 per cent): the higher of 8.4 per cent of capital or 2.4 per cent of sales.

4.9 DH assesses each company’s profits in each year. The rules governing the assessment are complex. The most significant aspects are that:

- the sales that are taken into account are sales of the domestic manufacturer (thus excluding parallel imports) to the NHS (as discussed in Chapter 2, these include sales to wholesalers, pharmacies and hospitals)
- UK revenue, costs and capital are allocated between the NHS and other customers
- costs and capital may be increased by ‘injection’ of R&D from elsewhere in the company and may be based on the transfer prices used in companies’ corporation tax returns
- research and development (R&D), marketing and information costs are subject to maximum allowances, and
- DH is entitled to satisfy itself that costs are properly incurred and are reasonable in the light of accepted commercial practice. If companies disagree with DH’s assessment, they may appeal to an arbitration panel, but no appeal on matters related to the profit control has yet been made.

4.10 If a company’s profits exceed the maximum, DH negotiates a repayment or price reductions. If DH is satisfied that a company’s profits are falling below the minimum, it agrees a price increase up to 65 per cent of the profit target.

4.11 Only companies with branded sales in excess of £25m per year are required to submit regular financial returns.39 Companies with branded sales of less than £25m are, in effect, outside the maximum profit control but must submit financial returns if they apply for price increases on grounds of insufficient profitability.

Difficulties with regulating and measuring profits in the pharmaceutical sector

4.12 Regulating profits in any sector can create a number of fundamental incentive problems:
- directly controlling profits undermines companies’ incentive to control costs. Cost increases may result in a company’s profits falling below target and hence potentially trigger higher prices, while cost reductions similarly may result in its profits increasing above target and trigger lower prices. Consequently, the financial effects of higher or lower costs fall on customers through price changes rather than on shareholders, reducing the incentive for companies to control costs

38 Specifically, firms are assessed on a ROS basis if their ratio of sales to total capital employed exceeds 3.5.

39 Companies with sales of between £1m and £25m must submit audited accounts, and DH has the right to call for full financial returns if circumstances warrant it.
• directly controlling profits rewards inputs (investment) rather than the relevant outputs (in the context of the pharmaceutical sector, drugs that benefit patients). A pure profit control remunerates all capital invested and makes no distinction between successful and unsuccessful investment, and
• a profit control also tends to distort investment decisions. If there is a single rate of return on invested capital which is above the cost of capital, companies have an incentive to over-invest in low-risk projects.

4.13 These incentive and information-related problems are particularly acute in the pharmaceutical sector. The sector is characterised by a high degree of innovation – new drugs are continually being produced which differ in important respects from existing products. Crucially, there is little systematic link between the costs and outputs of innovative activity in the pharmaceutical sector – through skill and ingenuity different firms will enjoy very different levels of success in producing useful drugs from a given level of expenditure on R&D. This raises a fundamental question about the desirability of seeking to regulate the profits of pharmaceutical companies.

4.14 The high rate of innovation also makes it particularly difficult to control profits, for example by benchmarking costs between pharmaceutical companies, because the outputs produced by each company are so different. Therefore a ‘reasonable’ or efficient level of costs is extremely difficult to determine for any individual firm.

4.15 Assessing profits in the pharmaceuticals sector also involves a number of specific measurement difficulties which are not experienced to the same extent in other sectors.
• pharmaceuticals R&D expenditure is particularly high. R&D has the economic characteristics of investment but is not treated as capital in some accounting treatments, including the PPRS
• the difficulty of calculating economic profitability is compounded by the relatively high proportion of pharmaceuticals R&D that is unsuccessful and by the relatively long time lags between R&D expenditure being incurred and the associated revenue being earned, and
• as noted in the last chapter, a high proportion of the costs incurred in developing and producing a drug (notably R&D and manufacturing costs) are ‘international’ in the sense that expenditure can take place anywhere in the world. This makes it difficult to verify the costs associated with supply to any one country. Additionally, R&D is a ‘globally common’ cost, which means that attribution of costs to the UK is particularly problematic.

Assessment of PPRS profit controls

4.16 Against this challenging background, this section assesses the approach to regulating profitability under PPRS.

4.17 The focus in this section is on the incentive effects arising out of the scheme’s rules, while the next section considers to what extent the scheme has had a material effect on firms’ behaviour in practice.
Weak incentives to invest in valuable drugs

4.18 Neither the R&D allowance nor the profit target take account of the characteristics of a company’s drugs portfolio. In particular, they are not linked to the benefit to patients of the company’s drugs. The R&D allowance and the profit target are calculated on total sales or capital and apply to off-patent brands, including non-originator brands, which do not necessarily require investment in R&D.

4.19 The possibility of earning high (or low) profits provides a strong incentive to companies to produce valuable drugs for patients. Imposing maximum and minimum allowed levels of profits in a way that takes no account of the value of drugs produced by a firm dulls those incentives.

Incentives to control costs

4.20 An important feature of the scheme is that several significant cost components (R&D, marketing and information) in the control are based on allowances rather than actual costs. This, to some extent, addresses the first fundamental incentive problem of profit controls identified above (the lack of incentive to control costs).40

4.21 However, the ROC target is more than double most companies’ cost of capital, creating an incentive to over-invest in PPRS capital, including buildings, plant and working capital (but not R&D expenditure).

Differential effects

4.22 Our analysis suggests that, in principle, various features of the profit controls are likely to apply differentially to different types of firm, even if they have drugs with similar characteristics.

4.23 For example, the R&D allowance favours large firms over small (other things equal, larger firms have more products and hence a higher allowance). In particular, the R&D allowance gives a larger firm a greater reward for introducing a new drug (not only is its allowance higher, but each new drug increases the allowance by 0.25 per cent of total sales41, which is worth more to a larger firm with a greater existing level of sales).

4.24 The R&D allowance also appears to favour global companies over those with all their sales to the NHS, since the latter can only claim their actual ratio of R&D to sales whereas global companies can claim up to the R&D allowance which is in most cases higher (under the 2005 PPRS, the R&D allowance is likely to average 22 per cent of sales42 whereas global R&D intensity is only around 15 to 18 per cent).

4.25 Smaller companies tend to show greater variability of returns over time and hence are more likely to exceed the annual profit cap than larger companies, even if long run profitability rates are comparable.

40 However, by the same token there is no means by which cost efficiencies made by companies can be translated into savings for the NHS, even in the long run, because the level of allowances is not obviously related even to average company costs.

41 Unless the company already has 20 or more new active substances, when its R&D allowance is capped at 25 per cent (excluding any new paediatric drugs).

42 We estimate the R&D allowance is likely to average 22 per cent for calculating the profit maximum, and 17.5 per cent for calculating the profit minimum.
4.26 Companies with little PPRS capital are disadvantaged as the ROS target is too low relative to the ROC target. ROS companies potentially suffer the disadvantage of not allowing fully for the cost of investing in intangible capital, such as R&D, but do not receive the benefit of a return above the cost of capital on PPRS capital.

4.27 The transfer pricing provisions favour companies importing from affiliates abroad over those manufacturing in the UK, as discussed in greater detail below.

4.28 In all, the sorts of companies potentially disadvantaged by these arrangements are smaller R&D intensive companies focused on the UK (and which are therefore unable to benefit from R&D allowance in excess of global R&D intensity and from transfer pricing arrangements).

4.29 We note that companies with sales to the NHS of less than £25 million are effectively outside the maximum profit control and that, in recent renegotiations of the scheme, DH has taken steps to reduce the bias against small companies. These include increasing the R&D allowance for firms in the first three years of submitting financial returns and increasing the fixed element of the marketing allowance. However, the potential disadvantages to small firms identified above remain.

**The PPRS profit control in practice**

4.30 Perhaps in recognition of some of the incentive problems discussed above, profit controls have reduced in importance in recent years, with the price controls becoming the major constraint. Several factors have combined to reduce the impact of the profit maximum and minimum.

4.31 First, there has been a wider margin of tolerance around the target profit, with maximum profits at 140 per cent and minimum profits at 40 per cent of target (as opposed to 75 per cent and 125 per cent prior to 1999).

4.32 There has also been an increasing wedge between target rates of return under the scheme and members’ cost of capital (as discussed further in Annexe H).

4.33 Where companies import from affiliates abroad, the PPRS profit control bases costs on transfer prices used in corporation tax returns. Transfer prices are now very important (we estimate that transfer priced products account for at least 70 per cent of sales), but in most cases are based on the resale-minus method. This creates an underlying circularity since the PPRS profit control seeks to base selling prices on transfer prices, but resale-minus transfer prices are themselves based on selling prices. Under the resale-minus method, higher prices, for example on new drugs, lead to higher costs not higher profits. The implication, in regard to a large part of sales, is that the profit control cannot be binding.

4.34 In recent years, the PPRS profit control has had very little, if any, effect in constraining companies’ behaviour: repayments of excess profits have been negligible – representing about 0.01% of revenues over the 1999 – 2004 scheme. Price increases agreed on grounds of insufficient profitability have also been negligible over the period.

4.35 Figure 4.1 and 4.2 show the trends in profit against the profit maximum for both ROCE and ROS firms from 1997 to 2004. Profits are shown relative to target so that profits under the 1993 scheme are more comparable with those under the 1999 scheme.
4.36 Figures 4.1 and 4.2 show that, under the 1999 scheme, very few companies have exceeded the profit maximum (under the 1993 PPRS, with its narrower MOT, rather more companies exceeded the profit maximum). A similar picture emerges for the profit minimum.
4.37 We do not consider the PPRS profit control is likely to become more of a binding constraint on companies’ behaviour during the course of the 2005 PPRS, since the relevant features of the 1999 PPRS remain in place.

4.38 Although the PPRS profit control is not constraining the behaviour of most companies’ behaviour, as noted some of its features, particularly the low target for ROS compared to ROC companies, have the potential to deter entry and/or rapid expansion by smaller R&D intensive companies focused on the UK (and which are therefore unable to benefit from R&D allowance in excess of global R&D intensity and from transfer pricing arrangements).

4.39 We did not identify companies above the £25 million limit for making financial returns that were currently disadvantaged in this way in practice. However, it was suggested to us by the BioIndustry Association that, as bioscience companies had started to market more products themselves (rather than in collaboration with larger companies), the role and impact of the PPRS was becoming much more important to smaller companies than was previously the case. Consequently, we would expect these effects to become more significant in the future, as an increasing number of drugs in the pipeline are produced by companies with the characteristics set out above.

**Conclusions on profit control**

4.40 In our view, a profit cap is in principle ill-suited to an innovative sector such as pharmaceuticals, primarily because it provides weak incentives to invest in the most innovative drugs. Further, there are major practical difficulties in assessing profits in the sector, due largely to the increasingly global nature of pharmaceutical costs and the significant levels of intangible R&D investment made by pharmaceutical companies. In practice, the profit control is not constraining the behaviour of most companies. It has the potential to deter entry and/or rapid expansion by smaller R&D intensive companies focused on the UK; while we do not have evidence that this is happening at present, it may become a more significant issue in the future.

4.41 In Chapter 5, we set out potential options for reform to address these concerns.

**Price controls**

4.42 Under the PPRS, companies have freedom of pricing for New Active Substances (NAS). For companies, this is one of the most positive aspects of the scheme, as it allows them to access the UK market without protracted negotiations over pricing and reimbursement. We note, however, that there are potential disadvantages for companies and the NHS in a drug receiving no assessment at launch – notably the problems such an approach may create for ensuring rapid, cost effective uptake of medicines. This is discussed further in Chapter 5.

---

43 The company must agree the price of other new products – including combination products containing active substances that have been marketed separately, active substances with new indications and variations in formulation, presentation or pack size etc. – with DH. In considering prices of such products, DH takes into account factors such as the price of other presentations of the same medicine or comparable products.
4.43 PPRS price controls limit the price of medicines already on the market and have three main features:

- a series of agreed overall price reductions have accompanied the introduction of each of the last three PPRS agreements. Recent price cuts have been 2.5 per cent in October 1993, 4.5 per cent in October 1999 and most recently seven per cent in January 2005
- at other times, PPRS companies are not permitted to increase the overall level of their prices, and
- the price control applies at a company level. Companies are able to vary prices of individual medicines within their overall limit. Under the PPRS this is known as modulation.

4.44 This section assesses the effect of these price controls, which have had a much more significant effect on companies in the recent history of the scheme than the profit controls. It first reviews the effect of the price cuts on NHS expenditure, then examines the efficiency properties and incentive effects of the cuts and finally assesses to what extent price modulation affects competition in drugs markets in the NHS. These issues are explored in greater detail in Annexe J.

**Effect of price cuts on NHS expenditure**

4.45 The PPRS price control, rather than the profit control, is currently the major instrument for controlling prices as all major companies have reduced prices under the price control but most are not constrained by the profit control.

4.46 There is little doubt that PPRS price cuts reduce primary care drug expenditure below the level it would otherwise be. Comparing expenditure in England for 2005 with that for 2004 shows savings in primary care (at 2005 volumes) of just over seven per cent from the new PPRS agreement. This reflects the reduction in reimbursement prices on both direct supplies and parallel imports, and represents savings of about £370 million for the UK (assuming a similar level of savings in Scotland, Wales and Northern Ireland). Savings will, however, reduce over time as companies introduce new drugs at uncontrolled prices. The extent of savings in the hospital sector is uncertain as the price control constrains list prices but hospitals usually negotiate to purchase below list prices. Several trusts have given us evidence showing the 2005 cut did not generate savings for them.

**Incentive effects and sustainability**

4.47 The level of price cuts is negotiated by DH and the ABPI and is not clearly linked to a comparison of UK prices with those in other EU countries or to other observable variables. Most importantly, it does not attempt to link prices to patient benefits, and therefore does not help to secure value-reflective prices. The one-off price cuts are imposed across all of a company’s products, irrespective of their therapeutic value. Given the freedom of pricing up front afforded by the PPRS and the demand side problems in the NHS discussed in Chapter 2, one supplier’s prices may be above average patient benefit while another’s may be below, but under the PPRS price control both have to reduce their average prices by the same percentage.

---

44 Table 6.1 in Annexe J shows savings for England of £410 million at list prices, but this reduces to about £370 million after taking into account that reimbursement prices are about 9.2 per cent below list prices due to clawback.
4.48 In the short run, this approach is not the best means, therefore, of helping the NHS secure value for money (that is, maximise health gains for a given health budget). Given the global importance of UK prices, price cuts are also likely to have important dynamic effects, since the scheme does not provide a mechanism of rewarding companies that produce drugs with a high therapeutic benefit over those that do not. It therefore gives no clear incentives to pharmaceutical companies to compete by investing in the most innovative and effective drugs.

4.49 It is true that the periodic cuts at least reward companies for bringing out new products (since those launched more recently will have been subject to fewer (or no) price cuts). However, there is no necessary correlation between new products and products that are particularly valuable to patients. As discussed in Annexe M, the fact that a drug receives a New Active Substance marketing authorisation does not necessarily imply that it is more valuable in therapeutic terms than existing products on the market. Therefore this approach is at best a blunt and indirect method of rewarding valuable innovation.

4.50 A further issue is that the price cuts, and in particular the prospect of future price cuts, may affect the price of new drugs. Companies set initial prices in the knowledge that there will be a price cut at the time of the renegotiation of the PPRS. While there may be other constraints on prices of new drugs, such as the prospect of NICE and SMC appraisals and parallel trading, firms are likely to take future price cuts into account when setting initial prices. The more these price cuts become a regular feature of PPRS, the more firms are likely to anticipate them in setting initial prices (by pricing above what they would otherwise have charged), particularly towards the end of a given PPRS period.

4.51 Under such an approach, price setting could become a strategic game in which firms attempt to guess the level of forthcoming price cuts and DH attempts to double guess this effect in setting the level of price cuts. We might expect the outcome of this game to be ever-increasing price cuts, which is consistent with what we have seen in practice (with cuts of 2.5 per cent, 4.5 per cent and seven per cent over the last three schemes). Continuing to seek to control prices through the simple mechanism of an unsystematic price cut (that is, one that is not obviously related to objective or verifiable criteria) does not, in our view, provide a sustainable model of pricing pharmaceuticals in the future.

**Effect of modulation on competition**

4.52 Companies make considerable use of modulation to vary the prices of individual drugs, especially at the time of overall price reductions. In January 2005, modulated products accounted for almost two thirds of total sales by value (around one third by products where the price was left unchanged, rather than cut by seven per cent, and around one third by products where the price was cut but not by seven per cent).

4.53 Although not stated in the PPRS agreement, DH measures modulated price changes using a current-weighted price index with volume weights based on direct supplies in the UK. That is, modulation applies to list as opposed to transaction prices, and it applies to volumes sold by the company in the UK rather than prescribed volumes (that is, it does not include parallel trade). Furthermore, because the index used is a current-weighted index it provides strong incentives for companies to concentrate reductions on drugs for which volume directly supplied is likely to increase in response to a reduction in the list price (that is, for which demand is price sensitive).

4.54 Modulation therefore has varying effects on competition according to the nature of the market. Accordingly, in considering the effects of modulation below, we draw on the analysis of Chapter 2, in distinguishing between effects on competition to secure a GP’s prescription, competition to supply pharmacies/wholesalers and competition to supply hospitals.
Competition to secure a GP’s prescription

4.55 Our survey of GPs suggests prescribers’ demand is relatively insensitive to price changes. Nevertheless, there may be circumstances where price does affect prescribing decisions and there is consequently brand-on-brand competition or brand on generic competition. Two organisations, while supportive of the PPRS generally, expressed concern about the effects of modulation on smaller companies:

- BIA (Biotechnology Industry Association) told us that, while it recognised the significant advantages that price modulation allows for larger pharmaceutical companies, it also recognised that price modulation can have a negative impact on smaller bioscience companies that typically have one or two products in their portfolios. It would normally take a smaller company many years to build up a portfolio where it could even begin to consider the possibility of price modulation, and

- EMIG (Ethical Medicines Industry Group) told us that, although it would not welcome the scrapping of modulation, it was concerned that price modulation has an effect on the R&D investment potential for many companies in the small pharmaceutical sector. EMIG said that small and emerging companies are not able to modulate in the same way as larger pharmaceutical companies, and that this imbalance in price adjustment gives rise to insecure financial planning in the small pharmaceutical sector due to the ability of larger pharmaceutical companies to modulate across a wider range of products and offset reductions accordingly. EMIG added that it could enable larger pharmaceutical companies to inadvertently price smaller competitors out of the market.

4.56 Competition between off-patent brands has been suggested to us as an area in which there might be greater than average sensitivity to price. Some new entrant brands have, for example, been able to compete with originator brands through offering a price discount, and marketing their products to PCTs and GPs accordingly. It is perhaps unsurprising that price can be a more important factor for competition between off-patent brands, since the products contain the same active substance, such that quality differences between them will be less significant than for therapeutic competition (that between brands with different active substances).

4.57 Price may also be more relevant where GPs are not subject to strong countervailing marketing from pharmaceutical companies. For example several PCTs have been successful in persuading GPs to prescribe a branded generic instead of generic simvastatin, which – as it is produced generically – is not specifically marketed to GPs by any one company.

4.58 In these circumstances, modulation creates the incentive for a multi-product company to increase the price of products which are relatively price insensitive and reduce the price, possibly to below marginal cost, of products which are relatively price sensitive. This would be to the advantage of companies with many products with differing price sensitivity, but is to the disadvantage of the NHS (which experiences higher cost), smaller branded suppliers (which find it more difficult to modulate because of their smaller product range) and generic suppliers.

4.59 Modulation may also increase the incentive to reduce prices of branded products ahead of patent expiry in order to discourage generic entry (because the price cuts can be funded by price increases on other price insensitive drugs). This is most likely for products with small markets where entry is relatively costly for generic suppliers.

---

45 It should be noted that price reductions cannot be included in modulation proposals where the patent/SPC has expired within one year before, or will expire within two years after, the date of modulation (six months and one year respectively for modulation at the time of a price cut such as 1 January 2005).
Competition to supply pharmacies: generic reimbursement

4.60 Pharmacies and wholesalers have a strong incentive to purchase drugs from the cheapest available source. In some circumstances, pharmacies are able to choose between a number of different brands or between one or more brands and generics, and similar issues may arise as with competition for prescriptions.

4.61 Under the 1999 PPRS, a number of companies sought to include, in modulation calculations, volumes supplied under ‘brand equalisation’ deals (as discussed, these are supplies of branded goods discounted to fulfil generic prescriptions). This would cost the NHS money (since it would not gain from the price cut on brand equalisation volumes) and would also provide the manufacturer in question with a significant competitive advantage against generic manufacturers. DH told us it had reached a satisfactory agreement with all but one company. Under the 2005 PPRS, brand equalisation volumes meeting generic prescriptions have been explicitly excluded from modulation volumes.

Competition to supply pharmacies: branded reimbursement

4.62 Pharmacies and wholesalers can also choose between direct supplies and parallel imports (which in the UK are reimbursed at the same price). Modulation creates a strong incentive for companies to target price reductions on brands with the highest penetration of parallel imports. Modulations at the time of the 2005 price cut seem to have led to a reduction in average parallel import penetration from about 22 per cent in 2004 to 18 per cent in 2005.

4.63 The development of parallel trade in the UK is depicted in the chart below. In 2005, parallel imports supplied about 18 per cent by value of branded drugs prescribed in UK primary care, or about £1.25bn at list prices.

Figure 4.2: Parallel import penetration on brands in primary care in the UK

Source: IMS, supplied by ABPI
The effects of modulations targeted on parallel imports are complex – and discussed in greater detail in Annexe J – but on balance are likely to be beneficial to the NHS. Perhaps most importantly, the advantages to companies of being able to modulate are likely to make them willing to accept in negotiations a larger overall price reduction than in the absence of modulation. In the longer term, lower parallel imports means a higher proportion of NHS payments going to the company which originally developed the product, and this may be expected to benefit innovation.

**Conclusion**

The price control has achieved savings for the NHS. However, we have concerns about the lack of an objective basis for the level to which prices are constrained and the impact of modulation on competition both between brands and between branded suppliers and generics.

We would also question whether a system that, while allowing freedom of pricing up front, seeks to control prices through subsequent price cuts (the size of which is not obviously related to any objective criteria) represents a sustainable model of pricing in the future.

**Company-wide controls and drug coverage**

As the above analysis suggests, PPRS profit and price controls have several key features in common that help to define the scheme as a whole.

One of these features is that both controls apply at the level of the company, across all branded products supplied – both on- and off-patent – rather than the level of the drug. This has led to concerns that the scheme favours companies with a broad portfolio of on- and off-patent brands over those that do not, since the controls are less binding on the former than the latter.

An incremental solution to this issue would be to make changes to the scheme’s coverage of drugs by excluding off patent brands from overall PPRS controls. This is one of the options considered in Chapter 5 of this report.

**Profit and price controls do not reflect the value of drugs**

However, as the above analysis has made clear, the most important concern we have with the scheme as it is currently designed is that neither the profit nor the price controls take account of the therapeutic value of drugs. This undermines the extent to which they can help secure value-reflective prices for the NHS. For a scheme that sets out to deliver value for money for the NHS and give companies the right incentives to invest, we consider this to be a significant flaw. As is discussed in Annexe K, which describes the case studies we have conducted as part of this study, the UK is almost unique in the world in not taking explicit account of the therapeutic benefits of drugs in its pricing system.

46 In principle, if severe enough, such disparities could create incentives for the licensing of drugs by companies for which PPRS constraints are binding to firms for which the are less binding (or even, for small firms operating predominantly in the UK, for the takeover of the former by the latter). This is because firms for which the constraints are less binding have greater profit- and price control- headroom to exploit useful drugs. While this hypothesis is more plausible in relation to price cuts (since they impose a greater constraint than the profit controls), we have not received any compelling evidence that this happens in practice.
4.71 Some companies we met in the course of the study argued that there was no need to link pricing to value as prices are already value-reflective in the NHS, through the operation of other demand side controls at a local and national level, and notably through the creation of NICE, SMC and AWMSG.

4.72 We have briefly commented, in Chapter 2, on the different influences on prescribers and the role of demand side controls. Annexe A gives further details. In short, while there is clearly variation in prescriber price sensitivity, our analysis suggests that GPs have fairly weak awareness of the relative prices of some of the most commonly prescribed products and, more importantly, that there is evidence of cost ineffective prescribing. The role of NICE, SMC and AWMSG is particularly relevant to the question of whether prices are value-reflective under current arrangements and, accordingly, we review the role of these bodies in Annexe B. A summary of our conclusions is presented below.

The role of NICE, SMC and AWMSG

4.73 We think the creation of NICE, SMC and AWMSG is a positive move towards a fairer and more efficient system of deciding how to use NHS resources. Cost effectiveness evaluation provides health policy makers with information to compare the costs and benefits of different health interventions to aid decisions on resource allocation. It can be a key tool in securing value for money across the health economy.

4.74 There are three principal rationales for the existence of NICE, SMC and AWMSG:

- to improve the quality of care provided by the NHS
- to secure value for money in the use of the limited resources the NHS has at its disposal, and
- to ensure that treatments are available uniformly across the country (that is, to eliminate geographical variations in access).

The role of the bodies

4.75 Each of the bodies provides guidance to prescribers on the cost effective use of medicines. The process by which cost effective evaluation is carried out varies between the three national bodies. NICE assesses both drugs and other healthcare interventions, but it does not consider all drugs, only those that are referred to it by the Secretary of State for Health. NICE has recently introduced a faster process to evaluate high priority drugs (such as those to combat cancer) so that guidance is issued closer to when the drug becomes available on the market. SMC assesses and makes recommendations on drugs alone, but, unlike NICE, it assesses all new drugs. AWMSG provides advice to the Minister for Health & Social Services on strategic medicines management and prescribing.

4.76 Each body attempts to assess the relative cost effectiveness of a drug by estimating the incremental costs and benefits associated with the drug compared to those of an appropriate comparator. Historically, NICE has carried out longer, more detailed assessments of drugs, developing its own cost effectiveness model, while the SMC and AWMSG provide more rapid recommendations based on a review of manufacturers’ own models. Costs taken into account are those borne by the NHS and Personal Social Services (PSS) budget – of which the list price of a drug is a significant component. Benefits relate both to extensions of life and improvements in the quality of life and are commonly expressed in terms of Quality-Adjusted Life Years (QALYs).
Although the bodies have not been set a formal cost effectiveness threshold, they generally recommend drugs if the incremental cost per QALY is lower than £20,000. Where the cost / QALY is higher than this, the probability of recommendation is lower, although the bodies may still do so on the basis of other factors, such as wider societal costs and benefits.

**Implementation of recommendations**

4.78 The recommendations of the three bodies are not binding on prescribers. However, for drugs that have been recommended, local health authorities must provide funding within 3 months for all patients for whom the recommendations apply.

4.79 The overall picture as regards the implementation of guidance is complex. Prescribing rates generally increase following positive NICE guidance, although in some cases not to the levels anticipated by NICE when the guidance was issued. There is a number of possible reasons for this, including clinical resistance and the difficulties experienced by PCTs in funding expensive new treatments.

4.80 In relation to the implementation of negative recommendations (applying to all or some indications), there are difficulties in interpreting the raw prescribing data, since they do not include information on patient indications. However, individual analyses that have been conducted lend support to the view that prescribers may not be following NICE guidance in all cases.

4.81 Furthermore, in Scotland prescribing of drugs for which SMC has recommended against prescription in all indications reached almost £5m in 2005. Non-compliance may be more of an issue in primary care compared with secondary care. Again, there are likely to be various reasons for non-implementation, including limited time to interpret and assimilate guidance, clinical resistance and possibly countervailing influences such as marketing activities.

4.82 Despite these problems, guidance does in many cases have an impact on prescribing behaviour. Positive recommendations can quite clearly increase uptake, for example. It follows that delays in providing guidance can inhibit uptake – the so-called problem of ‘NICE blight’.

**Issues to address**

4.83 The technical expertise that these bodies bring to bear in conducting cost-effectiveness assessments is of world class standard. A number of high profile, independent studies have given positive reviews of NICE in particular. Further evidence is provided by the fact that the assessments of NICE and SMC are used and referenced in all parts of the world.

4.84 In the context of increasing pressures on NHS budgets and ever-higher drug development costs we believe it is vital that this expertise be put to the best possible use in ensuring NHS resources are spent cost effectively. We have identified a number of issues to address if this is to be achieved. They relate primarily to the remits the three bodies have been given and fall into five high level categories:

- the restricted use that is made of cost effectiveness evaluation, in particular the inability to use it to inform prices directly
- the fact that recommendations of the bodies (positive or negative) may not be fully implemented, undermining the extent to which cost effectiveness assessments deliver value for money in practice, as
• the fact that not all drugs are assessed and, perhaps most importantly, existing drugs are not subject to the same level of assessment as new drugs
• institutional issues, such as the need for earlier engagement between companies and the cost effectiveness bodies, and
• some more technical issues relating to the principles for assessing cost effectiveness and the determination of maximum thresholds.

4.85 Annexe B elaborates on these issues and proposes some potential solutions. We discuss these in the context of considering options for reform in the next Chapter.

Evidence on whether prices are value reflective

4.86 Ultimately, whether or not prices are value-reflective under current arrangements is an empirical issue. That is why we have undertaken, as part of this study, an assessment of the relative costs and clinical benefits of some of the largest selling drugs in the NHS. This is set out in Annexe M. We have identified hundreds of millions of pounds of expenditure that we believe could be used more cost effectively, in allowing patients access to the drugs and other treatments they need, but where access is currently restricted.

4.87 Where access is restricted on cost or cost effectiveness grounds, it is vitally important that all drugs – old and new – are assessed on the same basis. This does not happen across the board under current arrangements. To restrict access to new treatments while ignoring inefficiencies in current expenditure is not an efficient use of resources. Nor is it in the interests of patients.

Stability and dialogue

4.88 Most companies we spoke to were, in broad terms, positive about the PPRS. But it has become clear to us that – freedom of pricing apart – it is not so much specific features of the PPRS that companies find positive, but rather the broader institutional framework within which the scheme operates, and, most importantly, the relative stability it affords them.

4.89 Indeed, in its second submission to the OFT, the ABPI argued that, specifically in relation to the strength of the PPRS as a factor in attracting investment to the UK,

“the value of the PPRS as an investment incentive is not a ‘direct’ effect of specific PPRS provisions, but a consequence of the stable framework it provides and the general ‘industry-friendly’ environment in the UK of which the PPRS forms a key part.”

4.90 We are entirely sympathetic with the view that ongoing dialogue between Government and industry is an important feature of a successful pricing regime. In Chapters 5 and 6 we set out how, in our view, this stability could be retained and indeed improved upon, under a reform of the scheme that addressed the concerns expressed in this Chapter in relation to the PPRS profit and price controls.


5 OPTIONS FOR REFORM

Introduction

5.1 This Chapter explores possible alternative approaches to the PPRS for the pricing and reimbursement of branded prescription medicines in the NHS. It builds on the analysis contained in the previous chapters of the report, which have considered the role of the PPRS within UK and international markets and analysed the scheme's profit and price controls. It also draws on a review we have conducted into pricing and reimbursement arrangements in ten major countries.

5.2 The Chapter is structured as follows:

- the first section sets out the key objectives that, in our view, a pricing scheme should aim to achieve. These form criteria against which to assess alternative approaches
- the second section provides a brief overview of alternative pricing and reimbursement regimes, drawn from our international survey of ten leading countries
- the third section sets out proposed reforms to the pricing of off-patent brands
- the fourth section draws up four possible alternative arrangements for the pricing of on-patent brands, including incremental reform to existing PPRS controls and reforms that involve replacing those controls with a value-based pricing approach, and
- the final section presents a high level evaluation of the options and provides a broad assessment of the likely costs and benefits of our preferred approach – a value-based approach to pricing.

5.3 Several companies and government stakeholders have told us that while value-based pricing may be attractive in principle it is very important to be clear on the details of how any such scheme would work in practice, in particular how institutions would work and the rules and procedures they would be implementing. This chapter and the next can only cover the key issues at a high level. Annexe L explains in greater detail how an alternative scheme could work in practice.

5.4 We should note that the objective of the report is not simply to set out our proposed approach, however, but also to explore alternative options and explain, where appropriate, why we have rejected them. We do so because a key role of this study is to improve the terms of debate about pharmaceutical pricing and reimbursement, not just in the UK, but internationally. Again, greater detail is provided in Annexe L.

Objectives

5.5 There are several high-level objectives that, in our opinion, should guide the design of a pricing scheme for branded prescription drugs. They relate to:

- achieving efficiency in the short and long run
- workability
- appropriately allocating risks between companies and the NHS, and
- transparency.

47 These are described in Annexe K.
Economic efficiency

5.6 We would regard achieving economic efficiency to be the most important goal of any drug pricing scheme. It captures the twin goals of delivering value for money for the NHS while providing the right incentives to companies to invest in drugs in the future. It is therefore central to the interests of patients in the short and long run. This concept of short and long run efficiency is at the heart of stated objectives of the PPRS, as discussed in the introduction to the report. In a sense all the other objectives we discuss can be considered subsidiary to this fundamental goal.

Workability

5.7 Any pricing scheme clearly needs to be workable in practice. Three important dimensions of workability for a pricing scheme are that it should: be practicable within information constraints; provide patients access to cost effective drugs within a reasonably short timescale and maintain stability of supply; and be legally defensible.

Allocation of risks

5.8 Both companies and public bodies have told us that stability is a very important attribute in a pricing scheme, in particular financial stability (for companies, stability or at least predictability of revenue and for Government, predictability of expenditure). In practice, this goal may be difficult to achieve when unforeseen events occur (such as the entry of a highly beneficial drug onto the market), calling for flexibility (that is, the ability to respond appropriately and rapidly to changing circumstances).

5.9 The design of a scheme must therefore recognise there is a trade off between stability and flexibility and that, in many cases, there is also a trade off between the degree of stability afforded to payers and that afforded to companies. Getting this balance right means allocating risks appropriately, which in our view implies that individual risks should be allocated to the entity most able to bear and manage them. Therefore, for example, companies should bear commercial and development risks, such as the risks relating to a product’s efficacy relative to those of substitutes, since this gives them good incentives to compete by investing in better products in the future.

Transparency

5.10 Transparency is important in the first instance because it underpins all the other objectives set out here. Companies must understand the risks to which they are exposed and the incentives that arise out of them to respond efficiently to a well-designed scheme (notably to invest in drugs that society values the most). Second, to gain the support of stakeholders a scheme should not only work well but be seen to work well. Companies, NHS bodies and patients should all be confident that decisions are made on a fair and equitable basis, with the reasoning clearly set out. The interests of the taxpayer should also be met in ensuring there is proper accountability for the use of public resources.

Conclusion

5.11 The objectives set out above should not be controversial in themselves, and indeed are either explicit or implicit within the current stated objectives of the PPRS. However, achieving them in practice involves difficult trade offs, and raises a number of different issues that need to be addressed in designing a pricing scheme. These issues are set out below.
Overview of pricing and reimbursement systems around the world

5.12 This section briefly reviews alternative approaches to setting prices for prescription drugs (often reimbursed prices) drawing on the international case studies conducted as part of this study. Each individual system represents a number of specific choices against the design issues discussed in Annexe L.

5.13 A summary overview of features of the systems we have reviewed is presented in the table below. It splits up the key approaches to pricing by type – for example, international reference pricing as opposed to profit controls – and according to whether they are applied before the drug in question can be reimbursed – ex ante controls – or once the drug is already on the market – ex post controls. This distinction between ex ante and ex post controls is a key one, which is reflected in two of the options that we consider later in this chapter.

<table>
<thead>
<tr>
<th></th>
<th>Ex ante</th>
<th>Ex post</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>free pricing / Immediate reimbursement</td>
<td>pricing relative to substitute</td>
</tr>
<tr>
<td>Australia</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Canada</td>
<td>✔*</td>
<td>✔**</td>
</tr>
<tr>
<td>Finland</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>France</td>
<td>✔</td>
<td>✔**</td>
</tr>
<tr>
<td>Germany</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Netherlands</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Spain</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Sweden</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Switzerland</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>UK</td>
<td>✔48 ✔</td>
<td>✔</td>
</tr>
<tr>
<td>US</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

*non-innovative drugs ** innovative drugs
IRP: International Reference Pricing
PVA: Price Volume Agreements

5.14 There is a lot of complexity in the pricing and reimbursement arrangements adopted by countries around the world, of which this table only provides a high level summary. For example, the US is a highly disaggregated system with many different payers (public and private) and intermediaries negotiating prices and reimbursement status. The table reflects the fact that in almost all cases, there is some form of assessment and negotiation before a drug can be included on the formulary of reimbursable products.

48 Free pricing takes place for New Active Substances only. Non new active substances are priced according to the provisions set out in Chapter 4.
5.15 It should also be noted that, although the UK is one of the few countries in the world (along with Germany) not to impose an absolute requirement for a decision on price before a product is reimbursed, this only applies to New Active Substances. Provisions for the pricing of non-New Active Substances are set out in the PPRS, as discussed in the last chapter. Furthermore, bodies such as NICE and SMC increasingly conduct early reviews of drugs in order to provide guidance on their use to prescribers in the NHS. A key difference between the UK and other countries is the fact that many other countries have a system in which the reimbursed price can differ from the price actually paid by patients.

5.16 For a detailed discussion of the systems summarised here, please see Annexe K. The UK system is described at length in Annexe A.

5.17 Despite the complexity of different systems, it is possible to identify three basic approaches to setting the price (more commonly the reimbursed price) of pharmaceuticals:

- approaches based on international reference pricing
- cost and profit-based approaches, and
- value-based approaches (a broad term comprising systems that set prices with respect to the price of substitute products or, if none is available, a placebo).

International reference pricing

5.18 International reference pricing (IRP) involves setting prices with reference to those set in other countries. Countries that use IRP as the sole approach to price setting effectively avoid taking an independent view on the appropriate prices of pharmaceuticals and rely entirely on the judgements of other countries.49 This might be a pragmatic solution for smaller countries, given the relatively high costs of carrying out independent assessments.

5.19 However, IRP involves a number of significant practical difficulties. First, it is often difficult to establish the prices that are actually paid in the countries referred to, given the extensive use of rebates in pricing and reimbursement systems.50 The approach also suffers from the numerous technical difficulties in making comparisons which were briefly discussed above.

5.20 Even if these issues could be addressed, the use of IRP would not be a viable approach for the UK to adopt. This is because, as discussed in Chapter 3, a significant number of countries already reference to the UK. Furthermore, our international research has confirmed that UK prices are often used in implicit price comparisons (that is, as part of company / country negotiations) even where they are not used in formal international reference price schemes.

5.21 Currently the UK, along with Germany, is one of the few major European countries that does not reference to other countries. Because the UK is a de-facto price leader in Europe we do not think it feasible to set prices here by international referencing since any attempt to do so would quickly render European prices circular. International reference pricing is therefore excluded from further consideration of options for reform in this Chapter.

---

49 In practice, most countries use IRP as one of a range of measures to price setting or only use it for a limited range of drugs. Canada and France provide examples.

50 The EU Pharmaceutical Forum is currently considering how to improve the transparency of pricing and reimbursement data exchanged between Member States, partly in response to such concerns.
Cost and profit-based approaches

5.22 An alternative approach is to seek to control the profitability of companies selling drugs to the public health system. The PPRS profit control is perhaps the only operational approach of this type in the world. While systems in Spain and Australia refer in principle to costs and profits as factors to be taken into account in deciding pricing and reimbursement, in neither country are these criteria used in practice.

5.23 In the last Chapter, we discussed difficulties with attempting to regulate the profits of pharmaceutical companies. The principle concern we have with a system that attempts to remunerate on the basis of inputs (costs) is that there is little systematic link between the costs and outputs of innovative activity in the pharmaceutical sector – through skill and ingenuity different firms will enjoy very different levels of success in producing useful drugs from a given level of expenditure on R&D. To these can be added practical difficulties, relating to the identification and allocation of costs, which arise primarily from the international nature of the industry.

5.24 We explore options for addressing the concerns above while retaining a cost-based scheme as part of our consideration of Option one.

Value-based approaches

5.25 As the table shows, most countries take some account of relative therapeutic benefits when setting the public reimbursement prices of branded prescription medicines. The approaches taken vary widely in terms of methodology and aims, however. We set out our views on the appropriate approach to take in the discussion of Options 2 and 3 below. Different value-based approaches are discussed in more detail in Annexe L.

Off-patent brands

5.26 This section explores options to reform the pricing of branded drugs for which the patent has expired, which are currently priced under the PPRS. It first summarises problems identified in other parts of the report, before recommending changes to current pricing and margin arrangements. Finally transitional arrangements are considered.

5.27 In the 2005 PPRS, it was stated that 'standard' branded generics (that is, non-originator brands) would, subject to public consultation, no longer be covered by the PPRS and would be transferred to the new arrangements for the reimbursement of generics. This consultation was put on hold pending the outcomes of the present study. Our recommendations cover both originator and non-originator off-patent brands.

Summary of problems

5.28 The most fundamental concern we have with current pricing arrangements for off-patent brands is that they do not deliver value for money for the NHS. Generic pricing arrangements (under the Category M scheme) have helped ensure that competition between generic manufacturers delivers savings to the NHS. In contrast, off-patent brands – whether

---

51 When prescribed by brand name. As explained elsewhere in the report, a brand dispensed to meet a generic prescription is remunerated as a generic unless the pharmacy can demonstrate no generics are available.
originator or not – are priced under PPRS price and profit controls and, in most cases, are many times more expensive than their generic equivalents. In Annexe M, we provide a range of estimates for savings that could be produced if off-patent brands with equivalent generic products were reimbursed in line with prices of their generic equivalents.

5.29 Considering brands with Category M equivalent generics only and excluding modified release products, we estimate that savings to the NHS would amount to about £65m per year from a change in reimbursement regime. All of the drugs considered in the analysis are fully bioequivalent (that is, consist of drugs of the same chemical form and strength). Therefore, very significant price disparities cannot be justified on value for money grounds – one of the fundamental objectives set out above.

5.30 In Chapters 2 and 4, we identified two further problems that have the potential to undermine competition between branded and generic manufacturers.

5.31 First, differences in the method of calculating reimbursement prices between brands and generics mean that the levels of margin earned on dispensing as a brand (at least, for domestically-sourced supply) are much lower than those earned on dispensing as a generic. This can be a source of considerable advantage to branded manufacturers competing with generics, since it allows them to market their products to GPs and PCTs as cheaper than generics and yet still sell to pharmacies at a higher price. Where this occurs, would also increase costs to the NHS.

5.32 Second, PPRS rules on modulation have the potential to distort competition between off-patent brands and generics by creating the incentive for a multi-product company to increase the price of products which are relatively price insensitive and reduce the price, possibly to below marginal cost, of products which are relatively price sensitive. This would be to the advantage of companies with many products with differing price sensitivity, but is to the disadvantage of the NHS (which experiences higher cost), smaller branded suppliers (which find it more difficult to modulate because of their smaller product range) and generic suppliers.

Options for reform

5.33 In Annexe L we assess several options for reform of reimbursement arrangements, against the objectives discussed above: principally whether they deliver short-run and dynamic efficiency and are stable. The options are:

- Option 1: Exclude all off-patent brands from price modulation returns
- Option 2: Reimburse pharmacies for dispensing against a prescription for a standard branded generic at the lesser of the Drug Tariff price of the comparable generic or the list price of the branded generic
- Option 3: Reimburse pharmacies for dispensing against a prescription for all off-patent brands (including originator brands as well as branded generics) at the Category M generic price, so long as the drug has a Category M equivalent, and
- Option 4: As for Option 3 but with additional steps to remove incentives to exploit margin differences. In the short term, it could involve passing margin effects through to PCTs via the financial settlement.

52 This reflects a 25 per cent brand premium, as discussed below.
5.34 We do not describe each of these options here, but simply present Option 3 – our preferred option – with a brief comparison to Option 2, which is, in essence, the option on which DH consulted in 2005 and 2006.

5.35 Two important components of Option 2 are that it would only cover non-originator brands (standard branded generics) and that the reimbursement price would be set at the lower of the comparable generic or the list price of the branded generic. In a Regulatory Impact Assessment (RIA) for the proposal, DH estimated the savings from such a change to be ‘some £10 million a year’.

5.36 Option 3 differs from Option 2 in three respects.

- first, the proposal is restricted to brands with Category M generic equivalents (rather than any generic equivalent). This is partly on grounds of tractability and ease of transition (as it would focus on an easily definable group of drugs accounting for the majority of expenditure implications, as shown above). More importantly, however, restricting the proposals to Category M drugs provides a mechanism by which in the future when drugs go off patent, generics have a chance to enter the market and foment competition before the price falls. This is essential to the stability and sustainability of proposed arrangements

- second, the proposal is that the off-patent brand price should be set at that of the generic comparator, rather than at the lower of the brand price and the generic comparator. Assuming the price of the generic comparator is set through the broadly competitive Category M system, we see no reason for setting the brand price below this, and

- third, the proposal includes both originator and non-originator brands. A central design principle, discussed at the beginning of this chapter, is that price should be value-reflective to promote static and dynamic efficiency. In our view, there is no argument for excluding off-patent originator brands from these principles. Indeed the arguments are if anything stronger when applied to off-patent brands, since under current arrangements there are some extreme examples of prices not reflecting value to patients (for example, twenty fold differences in price for chemically identical products).

5.37 However, it is important to maintain the impetus for generic prescribing, in order to retain incentives for generics to enter the market. If brands are reimbursed at the same price as generics, GPs may prefer to prescribe a brand by its name on patent expiry, as this is what their patients are familiar with. In the light of this, we would suggest that originator brands be reimbursed at up to 25 per cent above the generic price.

5.38 We also recognise that originator manufacturers may face parallel trade difficulties from a sudden change in the price of the brand, given the fact that patents expire at different times across Europe. To help companies deal with this, we would suggest they be given the option of making a payment to the NHS in lieu of changing the list price of their products.

5.39 It is also likely that there would need to be a limit on the list price charged by the branded supplier, to avoid the risk of loss to pharmacies.

5.40 Option 3 could in principle also address the potential for distortion arising from different levels of margin currently applying to brands and generics – because, if brands are reimbursed at the same price as generics, PCTs no longer have a financial incentive to encourage prescribing of brands. However, we note that Option 3 does not address the

---

margin issue at source. If margin-related distortions to competition persist, we think the most logical solution in the long run would be to continue the move in the current Pharmacy Contract to remunerate pharmacies through fees for service rather than through the Category M margin.54

Value for money benefits

5.41 As shown in the table below, we estimate Option 3 would deliver efficiency savings to the NHS of around £64 million per year if all off-patent drugs with Category M equivalents were reimbursed at generic list prices plus 25 per cent. This is based on 2005 data. In reality, savings under our recommendation (to apply a premium only to originator brands and not other branded generics) would be slightly higher than this figure and somewhere between the two figures presented in the table below.55

Table 5.2: Savings from reimbursing off-patent brands at Category M generic prices (plus 25 per cent) in 2005 (£ millions)

<table>
<thead>
<tr>
<th>Country</th>
<th>Cat. M equivalent plus 25%</th>
<th>Cat. M equivalent (no premium)</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td>£34.7m</td>
<td>£44.9m</td>
</tr>
<tr>
<td>Scotland</td>
<td>£15.4m</td>
<td>£20.2m</td>
</tr>
<tr>
<td>Wales</td>
<td>£2.7m</td>
<td>£3.2m</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>£11.0m</td>
<td>£14.6m</td>
</tr>
<tr>
<td>Total</td>
<td>£63.8m</td>
<td>£82.9m</td>
</tr>
</tbody>
</table>

Source: OFT calculations based on PCA and Drug Tariff data for the UK.

Recommendation

5.42 We recommend that:

- For **standard branded generics** for which there is a bioequivalent generic supply subject to Category M pricing, pharmacies should be reimbursed at the Category M generic price
- For **originator brands** for there is a Category M equivalent, pharmacies should be reimbursed at the Category M generic price (plus a maximum of 25 per cent)56
- In both cases, the list price of the brand supplier would not be permitted to exceed the reimbursement price by more than a given percentage, reflecting prevailing levels of clawback, and
- Furthermore, the **brands covered by these arrangements would be excluded from the PPRS price control, in particular its modulation provisions.**

54 It should be noted here that the positive incentive properties of Scheme M could be retained with a much lower level of retained margin.

55 Furthermore, this estimate does not take into account any savings from removing exploitation of brand / generic margin differences.

56 As noted, if suppliers wished, pharmacies could continue to be reimbursed at a price up to that prevailing before patent/SPC protection as long as the supplier agreed to repay to the NHS the difference between this price and the branded price.
5.43 Off-patent brands for which there is no Category M equivalent product would be reimbursed under the same arrangements as on-patent brands. These are discussed in the next section.

Options for reform of pricing of on-patent brands

5.44 This section summarises options for reform of pricing arrangements for on-patent brands. The main focus is on two variants of value-based pricing, which constitute our recommended approach. We briefly mention the other two options here – incremental reform to existing PPRS controls and local bargaining. A more detailed description of each of the options is again provided in Annexe L.

Option one: incremental reform to existing PPRS controls

5.45 Under this option, we assess how far incremental reform to the existing PPRS price and profit control could meet the objectives set out above, while retaining their fundamental characteristic of being imposed at a company level, rather than individual drug level.

Price cuts and modulation

5.46 As regards the price cuts, our finding was that they do deliver savings in primary care, but that the level to which prices are constrained is arbitrary as it is not linked to the therapeutic value of drugs to patients. We also found that the arrangements for averaging price increases and decreases (modulation) have the potential to distort competition (see Annexe J).

5.47 We believe there is limited potential for incremental change to address these problems (beyond the changes that would arise from removing off-patent brands from price modulation). This is partly because an element of arbitrariness is inherent to the current system of negotiated price cuts and control at company, rather than individual drug, level.

5.48 The potential distortion to competition could in principle be addressed by removing companies’ freedom to modulate prices but this would substantially reduce their flexibility, in particular to respond to parallel imports. Under the current framework, this would in turn make companies less willing to accept price cuts and hence may result in higher prices. Therefore, were company-level controls to remain in place, we would not be in favour of removing price modulation, beyond the removal of off-patent brands from modulation as discussed in the last section.

Profit control

5.49 As regards the PPRS profit control, as discussed in Annexe H, our principal concern was that it provides weak incentives for investing in the most beneficial drugs. In practice, we found that it does not constrain the profits of most existing member companies but may potentially have adverse effects in deterring entry and/or rapid expansion by research intensive small companies focused on the UK.

57 We have also given some thought to the method of averaging prices used in modulation calculations. At present DH measures delivery of the price control using current volume weights. Using base weights might reduce the potential distortion of competition but would create other problems, for example an incentive to increase the price of products for which demand is growing relatively rapidly.

58 We did not identify AFR companies with these characteristics that are currently disadvantaged in this way in practice. But the design of the scheme is a potential constraint on entry / expansion by such companies in the future.
More binding profit control

5.50 As noted above, one suggestion put to us was that price cuts should be taken out of the PPRS altogether, and if necessary replaced with a more binding profit control. While such proposals have not included any degree of detail, this section considers the feasibility of this option, by working through what, in our view, it would entail in practice.

5.51 Tightening the profit control so as to reduce reliance on price cuts would involve a number of problems.

• unless modified to reflect some measure of the value of the drugs produced by a company (a possibility we consider at the end of this section), a profit cap suffers from the fundamental problem that it provides weak incentives to invest in the most useful drugs

• a profit control based on the current PPRS approach to transfer pricing cannot be binding for most companies because they have the freedom to use, resale-minus transfer prices. Any binding profit control would require companies to provide, and DH or independent auditors to verify, data on costs incurred outside the UK. This would be very complex and burdensome both for companies and DH

• broad allowances do not reflect the individual circumstances of each company, and identifying an ‘efficient’ level of costs is extremely difficult in the pharmaceutical sector, since each firm has a very different portfolio of projects. It therefore seems likely that more reliance would have to be placed than at present on actual costs rather than allowances. This would reduce companies’ incentive to control costs and may lead to increases in costs and prices, and

• capitalising and depreciating R&D potentially reflects each company’s circumstances but it is unclear how R&D capital and depreciation should be allocated to the UK. Furthermore each of the main approaches to capitalising R&D involves incentive drawbacks: capitalising only successful R&D requires a target rate of return above the cost of capital, creating an incentive to over-invest in low-risk assets, while capitalising all R&D fails to reward successful rather than unsuccessful R&D.

Conclusion on Option one

5.52 Our summary conclusions on Option one are that:

• the case for attempting to replace the price control with a more binding profit control is weak. We do not think a binding control is feasible for the majority of companies that use resale minus transfer prices, without a very resource-intensive process of attempting to audit data on costs incurred outside the UK. Still less would it be possible to identify an ‘efficient’ level of costs under such a scheme. If a scheme were binding, it would therefore suffer from the fundamental incentive problems of giving poor incentives for efficient and effective expenditure

• We would be in favour of dropping the profit control altogether, but if it is retained, its potential adverse effects on smaller research intensive companies focused on the UK should be addressed. This could be done through modifying the profit target, increasing the R&D allowance for highly research intensive companies and smoothing profits for young companies, and

• A formal mechanism could be introduced to allow price increases on drugs where the avoidable cost of supplying the NHS exceeds NHS revenue.
5.53 These changes would not address our main concerns with the existing PPRS, in particular they would not provide a mechanism for linking prices to the value of patient benefits. In principle, notions of therapeutic value could be grafted on to current PPRS controls. For example, one suggestion we received was that the rate of return earned by companies should be linked in some way to the therapeutic value of a company’s products. This would be at best a very indirect way of attempting to set value-based prices and, given the problems with the profit control identified above, would almost certainly not be binding for most companies.

5.54 Alternatively, the level of the price cut could be amended to reflect therapeutic value. This has strong similarities with elements of Option two in particular (except that we envisage that it would apply at the product level rather than the company level). We discuss this option next.

Options two and three: ex post and ex ante value-based pricing

5.55 Options two and three would both involve replacing existing company-wide PPRS profit and price controls with controls reflecting the therapeutic value of individual products. We consider them together here because they are both based on similar principles: namely, establishing the maximum price of a product based on assessments of its incremental cost effectiveness relative to a comparator.

Overview of Option two

5.56 Under Option two – ex post value-based pricing – manufacturers would retain freedom of pricing for NAS at launch. Instead of profit controls and company-wide price cuts, the maximum list prices of all on-patent branded drugs would be reset according to analyses of cost effectiveness during price reviews occurring at five-year intervals, with the first review of each product falling at most five years after launch. This option would not involve ex ante price reviews. Existing arrangements for ex ante assessments would be retained, under which SMC and NICE (through the STA process) review the cost effectiveness of drugs and issue guidance to prescribers on their use.

Overview of Option three

5.57 Option three – ex ante value-based pricing – would move further away from the current PPRS by restricting manufacturers’ freedom of pricing for NAS at launch. In place of free pricing, this option involves a rapid upfront negotiation of price. In most cases, there would be a fast track pricing decision (that is, a maximum price agreed for an individual product). Conversely, if the data were clear at the time of launch that the drug was not cost effective (for example, the drug was clearly dominated and there was no possibility of reaching an agreement on price), then reimbursement would be refused. Prices set by the fast track ex ante process would still be subject to ex post reviews, to take account of such factors as a comparator product going off patent.

5.58 Where sufficient information at the time of launch was not available to take an informed view, there would be a possibility of negotiating a risk sharing agreement with the relevant authority, if the body in question agreed that the drug was suitable for such an approach. This would require the company and payer to agree a contract in which the drug is reimbursed, contingent on claims of clinical effectiveness being realised in practice. If expected outcomes are not realised, prices would be changed and / or repayments made. Risk sharing arrangements would not be the norm, but might be relevant for the treatment of chronic (as opposed to acute) conditions, where final clinical outcomes may only become clear after several years of use.
5.59 After any price change following a risk-sharing review, a reconciliation payment would be made between the manufacturer concerned and the Departments of Health to compensate for the difference with the initial price over the period between launch and the review. Thus if the agreed launch price was lower than the reviewed level, manufacturers would receive compensation for the difference over prescribed volumes in the interim. High interim prices would trigger repayments from companies to government. Reconciliation is intended to make the system as flexible as possible for manufacturers while avoiding perverse incentives to pursue risk sharing rather than the fast track ex ante approach.

5.60 In the following sections, we give a brief description of some of the common principles informing Options two and three before contrasting the ex ante and ex post approaches.

**Establishing the value of a drug**

5.61 In both approaches, the method employed for establishing the value of a drug would be key. As noted in the last chapter, a popular measure of the therapeutic benefits delivered by drugs and other interventions is the Quality Adjusted Life Year (QALY). In the UK, NICE and SMC often use QALYs to assess the benefits of medicines and inform cost-effectiveness decisions. QALYs are also used by many other pricing and cost-effectiveness bodies around the world.

5.62 Annexe B provides a detailed discussion of QALYs, including how they are derived and used in cost effectiveness analysis. In short, as a measure that allows comparisons to be made of the cost effectiveness of treatments across different diseases, we believe QALYs are a key tool in securing value for money across the health economy.

5.63 We recognise that there are areas of keen debate over their use. Some companies feel, for example, that the QALY measure is biased towards life saving drugs (that is, it is hard to demonstrate QALY gain in drugs which improve the quality of life for patients suffering from certain types of illness but do not increase their length of life). It should be noted, however, that where these issues do arise they often reflect fundamental problems of a lack of information (evidence that a drug does indeed improve a patient’s quality of life) rather than problems created by a particular methodological approach.

5.64 QALYs typically form the basis of Incremental Cost Effectiveness Ratios (ICERs) used for determining the value for money of a new treatment relative to an appropriate comparator. This ratio takes the following general form (where cost is measured in pounds and benefits in QALYs):

\[
\text{ICER} = \frac{\text{Cost}_{\text{New drug}} - \text{Cost}_{\text{Comparator}}}{\text{Benefit}_{\text{New drug}} - \text{Benefit}_{\text{Comparator}}}
\]

5.65 Under a value-based pricing approach, a maximum ICER would be set for all drugs.\(^{59}\) The price of a branded drug could not exceed the level at which its ICER (relative to a comparator product) reaches this threshold. The manufacturer could price below this threshold. However, once the product has been sold to the NHS at a given price, that price could not subsequently increase. This is primarily in the interests of budgetary stability for the NHS.

---

\(^{59}\) As suggested below, the level of the maximum ICER could be a matter of debate for the government and the pharmaceutical industry and could be reviewed in periodic renegotiations of a value-based PPRS.
5.66 Annexes B and L explore in some detail some of the more controversial issues in the assessment of the costs and benefits of drugs and other treatments. We give a brief consideration to two of these – non patient benefits and whether to recognise innovation per se – below.

**Non patient benefits**

5.67 **We are sympathetic with company views** that the notion of therapeutic value should embrace not just benefits to the patients themselves but to others who are affected by their condition, such as carers.\(^{60}\) In recent assessments, NICE has made some moves in this direction and this is to be welcomed.\(^{61}\)

**Whether to recognise innovation per se**

5.68 Some have suggested that a pricing system should also reward stages in the innovative process – ‘innovation in itself’ – over and above clinically beneficial outcomes. In practice, this would mean that a pricing scheme would recognise, in prices, any drug making a major step forward in treating a serious disease\(^{62}\) (for example by pioneering the pharmacological mechanism) even if it were ultimately ineffective (or at least no more effective than alternatives) and subsequent technological leaps were required before a clinically useful product could be achievable.

5.69 However, it is unlikely to be possible to define any meaningful pricing system that could address this problem. Such a system would call for a great number of discretionary awards based on suppositions about companies’ chances of success against many – potentially esoteric – scientific challenges with no clinical outcomes. It would therefore not only be inefficient for the NHS to spend money on ineffective drugs that could be allocated to fund proven medicines for patients with other conditions, it would also fail to provide transparent, clear investment incentives to companies.

**Which comparator to use?**

5.70 A key question under any assessment of cost effectiveness is which comparator to use for establishing the ICER of a drug. Under current arrangements, NICE, SMC and AWMSG define the relevant comparator as the (currently) best available treatment. In practice this may mean, depending on the drug in question, comparing it to the most clinically or cost effective available treatment or the most widely used treatment (that is, the marginal treatment that would be displaced by the new drug).

5.71 Some stakeholders in industry have expressed to us the view that on-patent brands should not be compared with generics in considering cost effectiveness, as this will reduce incentives to invest in new drugs. We do not agree with this position. In our view, given the limited resources the NHS has at its disposable, it cannot afford, on grounds of both

\(^{60}\) Again, whether and how to include them in the benefits taken into account in cost effectiveness assessments could be one of the high-level questions about a value-based PPRS to be agreed during periodic renegotiations of the scheme.

\(^{61}\) The benefits to carers included information on carer psychological well-being from the General Health Questionnaire (GHQ-30). (Clinical and cost effectiveness of donepezil, rivastigmine and galantamine for Alzheimer’s disease, NICE Health Technology Appraisal TA091, Guidance on drugs for Alzheimer’s disease: HTA Report, 2001.)

\(^{62}\) The following arguments can also apply to other aspects of pharmaceutical innovation. For example, research into new delivery mechanisms or storage solutions for drugs can be very valuable over time.
efficiency and fairness to patients, to ignore relevant comparators on the grounds that they are ‘too cost effective’. If the best available treatment is a generic, then new treatments must demonstrate their benefits in relation to the generic to receive higher prices. In the long run, we agree this will have effects on incentives to invest, but we believe they will be entirely positive, encouraging companies to target areas of unmet clinical need. Companies are given at least 12 years notice of a product going off patent and should be able to target their development activities accordingly.

5.72 However, we recognise that in practice there may be merit in allowing for some difference between the price of a brand and its generic comparator (over and above that suggested by differences in the clinical benefits of the two). There are two reasons for this. First, different drugs may have differential benefits for certain types of patient in ways that have not been demonstrated in clinical trials and formal cost effectiveness analysis – for example because effects occur in subgroups that are too small to be considered significant in broad population trials. Second, it may be desirable to maintain some form of wedge between the price of a brand and a generic to encourage continued generic prescribing, thus producing volumes sufficient to sustain vibrant competition in generics markets. This wedge – which we call a ‘brand premium’ – is discussed in greater detail in the box below.

Box 5.1: Brand premium

It may be desirable to allow a price premium for a brand over a generic comparator even if no benefits of the former over the latter have been demonstrated. This price premium – which we call a ‘brand premium’ – can be motivated by two considerations: to capture potential benefits to patients that have not been demonstrated formally in trials; and to sustain the stability of the generics market.

In relation to the first motivation, the highest-grade evidence on medicines is provided by Randomised Controlled Trials (RCTs) that control strictly for factors other than an investigated product that might explain observed therapeutic effects. To have statistical power RCTs need to be large – and potentially expensive and time-consuming. In some cases, an RCT may show no significant difference between two products when used in large populations, but individual patients may not tolerate one whilst thriving on another.

If an on-patent brand offers potential but unproven benefits beyond a comparator product available generically it may be appropriate to negotiate a brand premium. Any such premium would need to be proportionate, recognising that benefits have not been demonstrated, but are merely plausible. Later in this discussion – as well in Annexe M of this report that quantifies some of the potential benefits of value-based reforms to the PPRS – we suggest that premia of 50 per cent over the cost of comparable generics might be applied to a number of on-patent branded drugs. This practice has been used in other countries – for example, in its reviews of therapeutic groups, the Swedish pricing authority LFN has allowed for a premium of 25 per cent between clinically equivalent products (such as the PPIs) to reflect the benefits of having a variety of products on the market.

In relation to the second motivation, if a brand with potential but unproven benefits over a comparator generic were priced at parity with that comparator clinicians may switch prescribing to the brand in large volumes – possibly even larger than strictly required for medical reasons, for example due to clinical conservatism – which could destabilise production and consequently prices in the generics market, which are set partly by the interaction of supply and demand.63

63 Annexe A on competition in the NHS describes the Category M mechanism in some detail.
Because UK generics markets currently work well, and because generics prices are the most appropriate anchor for the prices of many branded drugs, it is important not to destabilise them. Applying a premium to brands should help to sustain this.

In practice, the level of the wedge would likely be negotiated by the relevant pricing authority and possibly informed by the views of the relevant cost effectiveness body concerning the plausibility of potential therapeutic benefits of the brand. This implies that the brand premium for an off-patent brand in relation to its generic equivalent (with the same active substance) would be lower – the only motivation for the premium at all is generic market stability. Accordingly, in our indicative estimates of savings from changes to the reimbursement arrangements for off-patent brands, we use a brand premium of 25 per cent.

5.73 The operation of brand and value-based premiums is shown in the figures below. In the first example, product A is assessed to deliver 1.5 QALY’s more than the comparator for a given volume of treatment. This is used to establish a maximum price. In this example, the manufacturer of product A sets a price below this maximum threshold.

**Figure 5.1: Value-based premium**

5.74 In the second example, product B is considered to deliver the same benefits as the generic comparator but may still price up to a maximum price of the generic comparator plus the brand premium.
A second important consideration – which is relevant whether or not a value-based pricing approach is adopted – is how to set the structure of prices. Currently, prices for reimbursing drugs in primary care are generally linear across volumes prescribed. That is, if one pack of drugs of a given form and strength is reimbursed at £1, then 1000 packs of the same drug at the same form and strength will be reimbursed at a total cost of £1000.64

In the pharmaceutical sector, linear pricing may not be efficient on two counts:

- pharmaceutical company costs are not linear across volumes supplied, and
- the value drugs bring to the NHS is often not linear across volumes prescribed.

In this section we consider each of these issues in turn before assessing the potential benefits of non-linear price structures. These benefits include improvements in short run efficiency, through better alignment of the interests of the NHS and companies and the reduction of socially wasteful expenditure. Non-linear pricing can also improve long run efficiency, particularly given the potential for parallel trade both within and across countries, through ensuring rents are shared exclusively between companies and public purchasers and allowing price differences to be maintained between countries with different abilities to pay for drugs.

---

64 It is not the case that prices are always linear in strengths (sometimes different strengths of the same drug will be flat priced). Nor are prices likely to be linear across volumes in secondary care, where, as described in Annexe A, procurement arrangements can secure price / volume deals.
Benefits to the NHS are not linear

5.78 Therapeutic value can vary significantly across different indications and patient groups. For example, a drug could be the most effective chemical in its class for most people but unacceptably dangerous in patients with other conditions or in combination with certain other medicines. Or it could be usually less effective than some alternative but the alternative may have no effect in some genetic types where the drug does. Or a drug could have sufficiently harmful side-effects in all patients that it is only recommended in high-risk cases.

5.79 Since the benefits of drugs are not constant over all volumes dispensed, nonlinear price structures could help improve value for money for certain drugs, by ensuring that premium prices are paid only on prescribing volumes that are likely to be clinically relevant.

5.80 For many drugs, nonlinear prices could also reduce incentives to incur socially inefficient marketing expenditure. Under current linear prices, there can be very high returns to marketing because the marginal cost of products is typically low and marginal revenues are constant. This can give very strong incentives for companies to market products outside of their cost effective indications.

5.81 Concern is often expressed within the NHS about the amount of money pharmaceutical companies spend on marketing their products. The sums involved are certainly considerable: in 2004, companies that submitted an Annual Financial Return (AFR) spent a total of £850m on marketing and sales promotion in the UK (16 per cent of total drug sales value). In response various stakeholders have called for an increase in NHS expenditure on so-called ‘counter-marketing’, for example, the advice given by prescribing advisers to GPs on the cost effectiveness of medicines.

5.82 Others have called for measures directly to curb marketing expenditure by pharmaceutical companies. As noted earlier, we do not consider this to be the best form of response, for all these approaches fail to address the root cause of high levels of marketing expenditure: the fact that linear prices give companies very strong incentives to maximise volumes, beyond the point at which prescribing is likely to be cost effective for the NHS.

5.83 Companies are simply responding to the financial incentives they are being given. If the NHS wants to reduce potentially wasteful expenditure, it should give better incentives to companies, through the prices it is prepared to pay for drugs, to engage in activities that maximise NHS productivity. This in turn should generate cost efficiencies for the companies.

Methods for implementing non-linear prices

5.84 In principle, it would be possible to implement non-linear pricing by reimbursing pharmacies at different prices for dispensing drugs against different indications and for different patient subgroups. To be implementable, this approach would, however, require the availability of prescribing data broken down by indication and patient group. The provision of prescribing data by indication is one of the objectives of the ongoing NHS National Program for IT (NPfIT) and may arrive within five years. Disaggregated data may arrive sooner in Scotland through the Community Health Index (CHI). Such disaggregated prescription data are not currently available, however, and so this approach is not a viable short term option.

5.85 In the absence of such information, it would be necessary to estimate up front annual prescription volumes for given indications and patient subgroups for which cost effectiveness
is likely to differ and then apply different prices to given prescribing volumes accordingly. For example, if a drug was found to be more effective than a comparator in only one indication, and the upper bound estimate of prescriptions against that indication was 10,000 packs of a given strength per year, a premium price would apply to volumes up to 10,000 and a price in line with the comparator for volumes in excess of that.

5.86 Estimates of relevant volumes would be challenging to produce up front. Companies must therefore be given appropriate incentives and support to demonstrate the cost effectiveness of drugs in different indications and subgroups. Value-based pricing would provide those incentives. The support companies would require has been set out in the Cooksey Review discussed at the end of this Chapter.

5.87 We also recognise that under a volume-based approach to nonlinear pricing there would be no guarantee that the drug would always be prescribed in the most cost effective indications. Guidance to prescribers will therefore remain an important part of any revised pricing arrangements.

5.88 There are two options for implementing volume-based approaches to nonlinear pricing:
- negotiate price volume agreements, whereby the reimbursement price changes after a certain volume of prescriptions is exceeded, and
- negotiate rebate arrangements, whereby a payment is made between companies and payers after a certain volume of prescriptions is exceeded.

5.89 The difference between the first and second options – price volume agreements and rebates – is that under the first, the price would change after the relevant volumes had been exceeded whereas under the second the price would be unchanged but a rebate would be made between the company and the payer (in practice likely to be DH, but this could be credited to PCTs on a pro rata basis).

5.90 As discussed in Annexe K, many countries employ approaches of this type, such as France, Australia and the US. Indeed, there is a precedent for rebate-type arrangements in the UK. Companies are able, for example to make a payment to DH in lieu of implementing the periodic price cuts negotiated through the scheme.

5.91 We think the second option – rebate arrangements – would be the most tractable and is therefore to be preferred. This is because applying different reimbursement prices for the same product (form, pack size and strength) would create significant difficulties in the supply chain. It would not be clear, for example, at what price a manufacturer should sell to any given pharmacy. If the sales price were related to the higher ‘premium’ reimbursement price, the pharmacy would be at risk of not recovering its costs (if it happened to dispense products at a time in the year in which the maximum premium volume had been exceeded). Similarly if the sales price were related to the lower reimbursement price, the pharmacy might over recover if it dispensed products before the threshold had been exceeded. Differential prices would also create the possibility of parallel trade within the UK.

5.92 Supply chain stability and parallel trade considerations are also directly relevant when considering the effect of differential prices across the EU. We think that here too there is a strong argument for allowing for a rebate system, in which the list price might differ from the value-based price paid by the Health Service. We discuss these issues in the next section.
Nonlinear prices and parallel trade

5.93 Parallel-traders legally exploit price differences in identical products between different countries when they are sufficiently large to cover transport costs and earn a profit. In the pharmaceutical sector, the price differentials that sustain parallel trade are caused by the interaction of two factors:

- the pricing systems set by individual countries, and
- pharmaceutical companies’ willingness to price-discriminate between different markets in order to maximise profit.

5.94 Companies operate within a system where individual countries operate national pricing regimes. Companies that have market power, and for which a high proportion of the costs of supply are fixed, can price discriminate by charging higher mark ups above marginal cost to the most price-insensitive buyers. In the context of the pharmaceutical industry, this implies charging different prices in each country. This form of price discrimination can be welfare-enhancing (over the alternative of a single price) for a number of reasons:

- consumers who would not be able to buy drugs at a uniform price are able to do so under price discrimination, resulting in an expansion of output and an increase in welfare, and
- firms have greater dynamic incentives to invest. Higher profits will provide greater incentives for firms to develop new drugs. In the pharmaceutical industry, where a high proportion of the costs are in R&D, this is particularly important.

5.95 Different prices also reflect the varying pricing regimes applying in different countries. In the pharmaceutical sector poorer countries tend to be more price-sensitive (that is, they are more likely to forgo drugs on the basis that they cannot afford them). In this context, price discrimination can have positive implications for equity.

5.96 While parallel trade may provide short term benefits to high priced countries, it is also likely to prevent firms from exercising price discrimination effectively. With untrammelled parallel trade, pharmaceutical companies may be restricted to charging a uniform price at which some countries – most likely the poorest – will be unable to buy their products. Moreover, since parallel traders incur costs and earn profits from their activities, they reduce returns on drugs, undermining incentives to invest.

5.97 To sum up, on a global (EU) level, parallel trade in pharmaceuticals may reduce efficiency, both statically and dynamically, as the allocative benefits of price discrimination and incentives for innovation are reduced.

5.98 In the short term, parallel trading may provide savings for consumers (typically public purchasers) in higher price markets as a result of the lowering of prices. This may be brought about both as a direct result of the purchasing of parallel imported drugs (which will be cheaper), and by the effect that the increase in competition in the markets for these drugs has on the pharmaceutical manufacturer’s pricing for domestically sourced products. In the UK, DH attempts to identify the savings made by pharmacies on parallel trade through the periodic Margin Inquiry. It then operates a clawback system whereby some of the savings made by pharmacies from the buying of parallel imported products are recovered by the NHS.

---

65 In order to maximise profits, they should set the mark up proportional to the inverse of the price elasticity of demand (‘Ramsey pricing’). Therefore, less price-sensitive buyers will be charged higher mark ups.
An important issue in assessing the size of this effect is identifying to whom benefits accrue. Two studies (one by economists at York, and the other by economists at LSE) appear to disagree over the proportion of benefits accruing to public health bodies in certain EU countries. The LSE study identifies parallel traders as the major beneficiaries, whilst the York study only estimates the benefits for governments and consumers. The evidence does suggest that there are some savings to national healthcare providers from parallel imports, although they may be relatively modest (approx £100m (1.5 per cent of sales) for the UK in 2002, see Annexe J).

However, it seems clear that there will always be an element of loss to the system – the costs incurred and profits earned by parallel traders. Therefore, pricing systems (such as those based on rebates) that take account of parallel trade effects may offer a win / win outcome for industry and government – by encouraging industry to accept a higher price cut than would otherwise be the case and ensuring the benefits are shared exclusively between industry and the public purchaser.

It should be stressed that this conclusion is particular to the pharmaceutical sector. This arises from the characteristics discussed above, in particular the cost structure of the sector and the fact that member states actively control drug pricing regimes. Therefore there can be no read through from this analysis to the effects of parallel trade in other sectors.

Furthermore, it should be stressed that nothing in this analysis suggests that measures to restrict parallel trade in the pharmaceuticals sector are necessarily consistent with competition law. The effects of any individual practice need to be assessed on a case by case basis.

Our conclusion, rather, is this: that, in designing and implementing a pharmaceutical pricing scheme it is not beholden on either public purchasers or manufacturers to ensure that sufficient price differences across Europe are maintained to sustain an industry designed to arbitrage against those differences. The option of allowing rebates to be paid in lieu of changing prices can in principle be in the interests of both payers and manufacturers and therefore benefit patients in the long run.

Under such an approach, where value-based pricing led to large price reductions, companies would have the option of retaining the existing reimbursement price and paying a rebate to the NHS equal to the difference between this price and the value-based price.

Setting the level of prices / size of the budget

There are two broad approaches by which price levels can be determined. Either prices can be fixed in advance and the budget determined ex post or (less commonly) the drugs budget can be fixed in advance and prices determined ex post. These different approaches can be termed ‘fixed price’ and ‘fixed budget’ methods.

A fixed price approach makes a fixed payment for each unit of output delivered by a company. Under a value-based approach to pricing, a fixed (maximum) price would be paid for each unit of incremental value delivered by a drug. The concept discussed earlier in this


88
chapter of a maximum acceptable ICER – expressed in terms of a cost per incremental QALY – is an example of a fixed price approach. Under this approach, the budget is derived each year according to volumes prescribed and the price assigned to each drug.

5.107 Fixed budget methods set the drugs budget in advance and derive prices actually paid ex post, at the end of the budgetary year. The simplest way of doing this would be to require payments to be made between the NHS and individual companies at the end of the year to deliver the amount of expenditure fixed in advance. If, for example, the budget was underspent, the NHS would make a payment at the end of the year, which would be distributed to companies on a pro rata basis. If the budget was overspent, companies would be required to make a payment to the NHS, again in accordance with revenues received in the course of the year.

5.108 Fixed price approaches are more common around the world. The current approach to pricing in the UK would fall into this category, for example. There are some examples of fixed budget approaches, however. New Zealand is perhaps the clearest example, as the drugs budget is fixed each year and Pharmac negotiates various deals (such as price-volume arrangements) with suppliers on all medicines so as not to breach it. There is a statutory requirement not to exceed the budget and in practice expenditure is consistently slightly below the maximum each year. France uses a hybrid of both methods. Annual drugs budgets are voted by parliament, suggesting that the overarching principle is a fixed budget. In practice, however, the regime relies on a fixed-payment approach, setting the prices of many drugs in a reasonably formulaic way according to an assessment of their incremental benefits over close therapeutic substitutes, with the result that the drugs budget often overruns.

5.109 The two options are perhaps best assessed in terms of their effects on the allocation of risks between companies and the NHS. A fixed budget approach would help the NHS manage financial risks, by fixing a major component of expenditure. For industry, this approach would also create certainty over aggregate expenditure. Individual companies, however, would be exposed to the sorts of risks to which the broader NHS is currently exposed. For example, their revenues would be reduced (rather than NHS expenditure increased) by the introduction (by a rival company) of a major, new life saving treatment onto the market, while their revenues would increase (as opposed to NHS expenditure falling) if the large selling drug of a competitor went off patent.

5.110 Since fixed budget arrangements constrain total expenditure, they also have the potential to increase competitive pressures between suppliers. If manufacturers of branded drugs were rewarded from a single, fixed budget according to the share of health benefits their products provided, drugs for different conditions would compete more explicitly for public funding. This may in turn change the terms of the debate about how pharmaceutical products are paid for by the NHS.

5.111 Decisions by bodies such as NICE would become less contentious, as they would be called upon to determine what proportion of the fixed budget companies would receive. The NHS would have fewer incentives than at present to apply volume controls to restrict expenditure, since under a fixed budget pricing scheme all drugs would be funded but the question would be at what price.67

---

67 As Annexe A discusses, while under current arrangements NAS are (more or less) freely priced, the NHS employs a number of demand-side controls in an attempt to restrict expenditure, including rationing or withholding them entirely in some cases.
5.112 These outcomes are potentially very attractive from an NHS perspective. The disadvantage of the approach is that hypothecating drugs expenditure in this way would restrict the flexibility of PCTs to shift resources from drug expenditure to other types of expenditure (such as that on elective care in hospitals) and vice versa. Therefore it would dampen any competitive constraints drug and non-drug interventions impose on each other. We also detected little appetite for a fixed budget approach among most of the companies we spoke to although this is perhaps in part due to the fact that countries that have adopted variants of the fixed budget approach have tended also to have secured low prices – New Zealand being an obvious example.\footnote{An exception was a suggestion put to us by several companies that resources for drugs that have received NICE approvals should be hypothecated within PCTs for use only on those drugs.} In principle, of course, a fixed budget approach would be consistent with any overall level of expenditure.

5.113 We think either approach – fixed prices or fixed budget – could be made to work in the UK. We think there is particular merit in considering the fixed budget approach, for the reasons discussed above. We note, however, that the approach would represent a greater departure from current arrangements and that the experience of drug budgets in the UK in the past suggests that keeping to a fixed budget can be difficult to achieve in practice. While we believe the approach set out above would be perfectly possible to implement, it would perhaps require a wider ranging reform of NHS funding arrangements and may only be a long term option.

Institutions

5.114 Institutional design is key to any reform of pricing arrangements. Institutions must work well and be seen to work well, inspiring confidence in key stakeholders. Stakeholder interactions would be most frequent with pharmaceutical manufacturers, whose goodwill would be critical. In any value-based system, there will be ‘winners’ and ‘losers’ among individual drugs. Companies would only accept this when decisions were clearly reasoned and issued by authorities with a reputation for fairness in the application of rules, and appropriate flexibility.

5.115 Chapter 6 of this report gives our view as to how new and existing institutions might implement a value-based approach to pricing.

Comparison of Options two and three

5.116 The key difference between Options two and three is clearly the requirement for a price negotiation before a drug comes onto the market under the ex ante approach. This is important on a number of fronts.

Speed of access and uptake

5.117 Option two retains the benefit manufacturers enjoy under the current PPRS of ensuring rapid access to the market for pharmaceutical products. As noted, it is the freedom of pricing afforded by PPRS that is one of the most positive aspects of the system in the eyes of industry. Most manufacturers we spoke to therefore expressed a preference for ex post as opposed to ex ante approaches to pricing. There is some evidence, set out in Annexe D, that drugs come onto the market more rapidly in the UK than in other countries and this is likely to be partly the result of the liberal ex ante pricing regime in the UK.
5.118 However, a further argument that has been put to us is that, for certain types of drugs, an upfront assessment demonstrating the drug is cost effective can have a positive effect on uptake. As discussed in Annexe B, there is evidence to suggest that positive recommendations from NICE can increase uptake of drugs, and therefore that, in the absence of an assessment, uptake would be lower. This suggests that for such drugs there would be a real benefit – for patients and companies – in securing an early-stage assessment. It is worth noting that an example of a company that did express a preference for some form of ex ante assessment was one that operated predominantly in the secondary care sector, where NICE guidance may have the greatest impact.

5.119 Ex ante pricing clearly involves a robust estimate of cost effectiveness to be available at the time of launch. Drugs for acute conditions, in which final endpoints are observed over a relatively short period of time, would be natural candidates for such an approach. For many medicines prescribed for small groups of patients in hospital settings – such as an increasing number of modern cancer therapies targeted at specific genetic types – clinical trials available at launch may give a reasonably accurate picture of true clinical efficacy. The controlled conditions of trials, where patients are treated under constant supervision and followed up closely, resemble those in which some hospital drugs are used in practice.

**Bargaining and risk**

5.120 Whether drugs are assessed before they come onto the market or after has a potentially significant effect on the bargaining position of payers and companies. Under an ex post approach, the bargaining position of the payer would be weaker than under an ex ante approach. This is because the ultimate sanction of any payer – that of withdrawing reimbursement – would be a less credible threat once a drug is already on the market, as it is more difficult to withdraw reimbursement for a product currently being prescribed (due to patient habituation) than to refuse it for new products. It may therefore be necessary to resort to statutory provisions to ensure maximum prices are adhered to in practice.

5.121 Conversely, under an ex ante approach companies would be exposed to a greater extent to risks of delaying tactics by payers, who might wish to prolong negotiations simply to have to avoid paying for a product. Institutional design would be key, here, to ensure that the body making these assessments had no such incentives.

**Efficiency**

5.122 The main advantage of ex ante as opposed to ex post approaches is that the benefits of more value-reflective prices will be felt by the NHS at all stages in a drug’s commercialisation and, for positive assessments, it should help ensure predictable uptake for manufacturers. Benefits in terms of value for money and improved investment incentives would be enhanced.

5.123 As noted, the onus on institutions carrying out assessments to be competent, fair and carry out their assessments rapidly would be greater, but if this can be achieved the outcome should be mutually beneficial for the NHS and innovative companies alike.

**Risk sharing**

5.124 Perhaps the most novel feature of the ex ante approach is the facility to negotiate risk sharing contracts, which are in a sense a hybrid of ex ante and ex post approaches. We should note that these would only be used in a limited number of cases – where there is genuine doubt about the efficacy of a drug and reasonable expectations that uncertainty can be addressed within a reasonable timescale.
5.125 Risk sharing arrangements can in principle help coordinate the expectations of the payer and manufacturers. They may allow for more predictable uptake for manufacturers, and predictable health gains for a given expenditure for the NHS for drugs for which an agreement may not be able to be reached otherwise. There is, however, a question as to whether the use of contracts would be overly burdensome to agree and audit, given the information and resource constraints.

5.126 These challenges are real and will in many cases mean that risk sharing approaches are not suitable. While risk sharing is attractive in principle, we cannot ignore the fact that the experience of risk sharing in the UK to date has been problematic. The example of the Government’s risk sharing scheme for beta interferon and glatiramer is discussed in Annexe L.

5.127 Nevertheless, we believe that risk sharing is a potentially promising approach for the future for drugs where there is a plausible but unproven value proposition and there are reasonable prospects of data being available in the medium term to make a more thorough determination. We understand one manufacturer has recently negotiated two risk sharing contracts in France.

Option four: local bargaining arrangements

5.128 The previous options have considered reforms to the PPRS that would retain the scheme but either modify the profit cap and price cuts, in the case of option one, or replace those mechanisms with more value-based alternatives in the case of options two and three. The remaining alternative we have considered is to remove the PPRS entirely.

5.129 Removing the PPRS was explored in discussions during the 1990s including the 1998/99 negotiations that preceded the 1999 scheme. These discussions led to a joint assessment by DH and ABPI of the scope, pace of change and practical impact of competition in the supply and use of branded medicines for the NHS. This assessment was unable to find evidence of consistent volume responses to price changes, suggesting that – in the absence of other measures – pharmaceutical companies would not have strong incentives to constrain the list prices charged for branded drugs. We do not believe the position has changed significantly since then.

5.130 This evidence, and the significant evidence of cost ineffective prescribing, persuade us that there is a continued need for instruments to ensure that the NHS obtains value for money in its purchases. As noted elsewhere in this report, we view this desire on the part of a customer to secure value for money as a necessary feature of competition, and not as a form of regulation. Consequently, we do not regard removing a national level demand side instrument such as the PPRS as in itself a deregulatory measure. Those who have called for ‘deregulation’ appear to be calling for price negotiations at a more local level to substitute for national level instruments.

5.131 We therefore felt it was important to explore what sort of outcomes might be produced through local-level instruments substituting for national level instruments. Thus, in this section we consider an option for reform involving primary care organisations (PCOs) negotiating primary care prices with the suppliers of branded drugs. We recognise that, since this represents the most radical of the reform options, our considerations of its outcomes are necessarily more speculative.

69 The health service is no different. In every country we examined in our international case studies – including the United States – we found that payers negotiated strongly with companies over the prices they pay.
5.132 This option would require PCOs to negotiate prices with manufacturers. There is uncertainty both about whether this option could be implemented in practice (it would require each PCO to negotiate secret repayments with manufacturers) and about the outcome if it can be implemented.

5.133 Price levels would depend on PCOs’ bargaining strength which depends on their influence over prescribing decisions and is highly uncertain.

- if PCOs have little influence over prescribing decisions, prices are likely to be higher than under other options to the detriment of the NHS, and
- if PCOs have a lot of influence, effective negotiation could push prices very low, but such prices might be below the level that provides a reasonable return on R&D investments by pharmaceutical companies.

5.134 We note that there is considerable uncertainty regarding outcomes under this approach. In the future, with a significantly reorganised NHS, it may become more attractive. But this would require major change in the institutions of the NHS and is not a near term prospect.

Evaluation of options

5.135 Each of the value-based approaches – Options two and three – for reforming the PPRS presented above has particular strengths and weaknesses. However, in our opinion the best long-term arrangement for the UK would be Option three: to replace PPRS profit controls and price cuts with an ex ante value-based approach to pricing. Under this approach, if, at the time of launch, trials data supported the value proposition of the company, a fast track pricing decision would be reached. There would still be a need for five yearly ex post reviews of such drugs, largely to take account of comparators going off patent. Where sufficient information was not available at the time of launch, but there was a prospect of it being developed after a period of use in clinical practice, a risk sharing contract could be agreed. This would only be in a minority of cases.

Overview

5.136 We consider Option four to be the most speculative of the options for reforming the PPRS. There is uncertainty both about whether this option could be implemented in practice and about the outcome if it could be implemented. Price levels would depend on PCOs’ bargaining strength which depends on their influence over prescribing decisions and is highly uncertain. If PCOs had little influence over prescribing decisions, prices would be higher than under other options to the detriment of the NHS. To be feasible, the option would require considerable organisational change and is not a near term prospect.

5.137 In relation to Option one, we have considered a range of potential options for modifying the existing instruments of the PPRS. We considered that there is limited potential for incremental change to company level price cuts (beyond the changes that would arise from removing off-patent brands from price modulation).

5.138 We think the case for replacing price cuts with a more binding profit control is weak. We do not think a binding control is feasible for the majority of companies that use resale minus transfer prices, without a very resource-intensive process of attempting to audit data on costs incurred outside the UK. Still less would it be possible to identify an ‘efficient’ level of costs under such a scheme. If profit controls were more binding, the scheme would therefore be more likely to suffer from the fundamental incentive problems associated with profit caps (namely, encouraging companies to inflate costs).
5.139 Despite its limitations the PPRS is sometimes said to have the advantage of stability. We agree that a stable regulatory environment is an important factor in investment decisions for a global industry. But we do not think that the PPRS as currently constituted guarantees such stability in the future. An important aspect of the PPRS that seems incompatible with stability is the increased emphasis on one-off price cuts at the start of each new scheme. The trajectory of the price cuts has been rising – from 2.5 per cent in 1993, to 4.5 per cent in 1999 and seven per cent in 2005. Moreover, price cuts necessarily have an element of arbitrariness since they apply to all branded drugs irrespective of therapeutic value, and are not obviously related to external parameters.

5.140 Since companies have freedom to set prices initially, the more price cuts become a regular feature of PPRS, the more firms are likely to anticipate them in setting initial prices (at the optimal price plus anticipated percentage price cut) particularly towards the end of a given PPRS period. If this continues, price setting risks becoming a strategic game in which firms attempt to guess the level of forthcoming price cuts and DH attempts to second guess this effect in setting the level of price cuts. We do not consider this to be a sustainable model of pricing for the future.

5.141 In short, incremental changes to existing controls would not address our main concerns with the existing PPRS – that neither the profit control nor the price cuts accounts for the therapeutic value of the drugs they affect. As shown in Annexe M of this report, under current arrangements, drugs that are close clinical substitutes can sometimes have widely divergent prices. This does not represent value for money. Further, failing to reflect relative clinical benefits in prices could also fail to give manufacturers the right incentives to invest.

5.142 Other aspects of UK pharmaceuticals policy, such as the creation of NICE, SMC and AWMSG in part compensate for the fact that the PPRS is not value-reflective. While these bodies are regarded as highly expert in the assessment of clinical and cost effectiveness and have made a major contribution since their creation, we believe that the restricted remit they have been given limits the extent to which they can ensure resources are used cost effectively.

5.143 These restrictions relate, in brief, to: the inability to use cost effectiveness analysis to inform price setting directly; the uneven implementation of guidance; the fact that not all drugs are assessed; and the fact that existing drugs are not always subject to the same level of assessment as new drugs. These considerations are set out in detail in Annexe B. Our Options two and three are aimed at relaxing these restrictions.

5.144 In short, we believe there is a compelling case for adopting a value-based approach to pricing within the PPRS, as the best available means of delivering the high-level objectives of the scheme of securing value for money for the NHS whilst providing appropriate incentives for manufacturers to invest in beneficial drugs in the future.

5.145 Many stakeholders have agreed that value-based pricing is attractive in principle but have expressed concerns that it would be costly and difficult to implement in practice. They have also highlighted the key importance of institutional design, given the central role any pricing body would have under such an approach. In the remainder of this report, we address both concerns.

5.146 First, in the rest of this chapter, we attempt to provide a high-level indication of the benefits that might be expected to accrue from value-based pricing and compare those with the costs of implementation. In the final chapter, we set out proposals for how new and existing institutions could implement our proposed options two and three in the short, medium and long term.
Costs and benefits of value-based pricing

5.147 Value-based pricing can have positive short-run and long-run effects. In this section we explore these effects in greater detail, considering first how inefficient prices can distort company investment decisions (long-run effects) and second how they can undermine value for money and exacerbate rationing in the NHS (short-run effects). We believe these inefficiencies could in part be addressed by adopting a value-based approach to pricing.

5.148 The following discussion seeks to capture the order of magnitude of possible costs and benefits of value-based reforms to the PPRS, rather than providing a detailed account. It bears noting, however, that the potential benefits are very large—in financial terms in both the short and long run, and in clinical terms over the medium-to-long run. Benefits are of a different order of magnitude altogether to the costs.

Benefits

5.149 The most immediate benefits of adopting value-based mechanisms within the PPRS are set out in Annexe M. They are potential efficiency savings from adjusting the current prices of certain on-patent branded medicines to be more in line with their clinical benefits relative to close therapeutic substitutes available generically. These efficiency savings, which could under an alternative scheme be reallocated to more prescribing of existing or future drugs, provide an initial indication of some of the gains that could be achieved through value-based pricing.

5.150 Substantial further gains may be available over the longer term because setting prices to reflect incremental therapeutic benefits delivered beyond existing medicines would influence manufacturers’ incentives to invest in areas of unmet clinical need. As discussed below, the influence of UK prices on the investment decisions of the global pharmaceutical industry should not be dismissed since the UK affects prices and demand in many other countries through the mechanism of international reference pricing.

5.151 The two tables below summarise efficiency savings from the initial exercise to quantify the benefits of value-based pricing conducted in Annexe M. The first table shows potential savings on branded drugs where we believe that all current prescribing volumes would be efficiently reimbursed at prices nearer to the cost of closely substitutable generics.

5.152 The second table shows savings on a class of branded drugs where we believe that only some current prescribing would be efficiently reimbursed at lower prices than today in order to reflect clinical benefits delivered beyond next-best comparator medicines.

5.153 As discussed in Annexe M, in order to generate the savings shown in both tables we conducted a review of publicly available information on the relative therapeutic efficacy of each branded product (or class) and generic comparator shown. We also took advice from a panel of clinicians, pharmacists and pharmacologists to help us interpret the published clinical trials.70 In relation to the first table we concluded that there is little evidence of clinical superiority for the brand(s) in most patients. However, the class of drugs in table 5.4 does provide significant incremental benefits beyond alternative chemicals available generically for some patients.

---

70 As noted in Annexe M, this analysis should not be considered advice to prescribers nor clinical guidance.
5.154 All savings calculations are based on a reimbursement of the brand at a rate 50 per cent above current generic prices (the ‘brand premium’). This is in recognition of potential clinical benefits that have not been formally demonstrated through randomised controlled trials (RCTs) and formal cost effectiveness analysis.

**Table 5.3: Savings from reimbursement changes, 2005 volumes**

<table>
<thead>
<tr>
<th>Product</th>
<th>Comparator</th>
<th>Generic price plus 50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atorvastatin</td>
<td>Simvastatin</td>
<td>£352.0m</td>
</tr>
<tr>
<td>Rosuvastatin</td>
<td>Simvastatin</td>
<td>£28.0m</td>
</tr>
<tr>
<td>Proton Pump Inhibitors</td>
<td>Omeprazole</td>
<td>£91.5m</td>
</tr>
<tr>
<td>Levocetirizine, Escitalopram</td>
<td>Cetirizine, Citalopram</td>
<td>£28.3m</td>
</tr>
<tr>
<td>Cardura XL®</td>
<td>Doxazosin</td>
<td>£10.9m</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>£510.7m</strong></td>
</tr>
</tbody>
</table>

5.155 Savings in Table 5.3 are calculated on the total UK primary care prescribing volumes across all presentations of each brand shown (all branded chemicals in the class in the case of the PPIs). For each branded product, savings are estimated for each presentation by multiplying 2005 volumes by the difference between the current list price and an eighteen-month average of the generic (Category M) price, up-rated by 50 per cent, of the equivalent dose of the comparator. Average prices are used for comparator drugs because UK generics prices can exhibit some volatility month by month.

5.156 We recognise in relation to atorvastatin – which represents a high proportion of potential savings – that efforts have been made to reduce prescribing rates in 2006. The aggregate results of such efforts are not yet available but we might expect current volumes – and potential efficiencies – to be lower than those shown here.

**Table 5.4: Estimated savings from reimbursement changes, 2005 volumes**

<table>
<thead>
<tr>
<th>Product</th>
<th>Comparator</th>
<th>Generic price plus 50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>A2RAs</td>
<td>Generic ACE inhibitor</td>
<td>60% of 2005 total UK prescribing volumes</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.157 The approach in Table 5.4 is the same as above except that savings are calculated on only 60 per cent of total primary care prescribing for the angiotensin II receptor antagonists (A2RAs). This is because, as discussed above and set out more fully in Annex M, they are likely to provide additional therapeutic benefits relative to the comparator to some, but not all, patients they are prescribed for. In our view, these products represent potential strong candidates for price / volume or rebate agreements, since the current linear price structure arguably gives companies the wrong incentives to incur marketing expenditure.
5.158 With regard to Tables 5.3 and 5.4, it must be noted that we would not expect gains estimated on the basis of prescribing volumes observed in 2005 to persist indefinitely. The products considered in this assessment will go off patent in a few years and, indeed, one of the PPIs lost patent protection in December 2005. We would argue that, in the absence of a value-based approach to pricing, there is a greater possibility of drugs continuing to be prescribed in the future at prices that do not reflect their value, but it is difficult to speculate on medium term outcomes at this point.

5.159 Therefore it is important to recognise that the estimates above represent a snapshot view, as of 2005. They are indicative of how outcomes for some drugs might be different under a value-based pricing scheme. We must stress that is not the role of the OFT to provide a definitive view of the appropriate prices of drugs. That role would fall to the appropriate expert body under any revised pricing arrangements.\textsuperscript{71}

5.160 We have tried, rather, to assess to what extent prices under current arrangements may not be value-reflective and hence whether there is a case for reform. We feel that our assessment provides strong evidence that reform should take place, in the interests of ensuring the best healthcare outcomes for patients as well as appropriate and stable incentives to invest for companies in the long term.

5.161 It is important also to emphasise that the savings could be reinvested in improving access for patients to drugs and other healthcare interventions and improving the supply of useful drugs in the future. We take up these issues below.

\textit{Short-run benefits – value for money and patient access to healthcare}

5.162 When the prices of prescription medicines do not reflect their relative therapeutic benefits the NHS may obtain poor value for money in the short run. Box 5.2 below investigates the question of how inefficient expenditure might constrain healthcare budgets that could be put to other uses – and exacerbate problems of rationing in the NHS. It is important to stress that savings on poor value drugs might also release resources for other valuable, but high-cost, medicines.

\begin{boxedminipage}{\textwidth}
\textbf{Box 5.2: The effects of inefficient drug prices on access to healthcare}

The resources available to the NHS for expenditure on drugs and other healthcare interventions are limited. This implies that, if the price of a treatment is out of line with its relative therapeutic value, the NHS is not making the best use of its funding to improve patients’ health. More value-reflective prices would achieve a better outcome for patients, allowing wider access to therapies on a timely basis.

It should be noted that drugs budgets are not fixed. PCOs receive needs-based funding which they have discretion to allocate to a number of uses, including primary care prescribing and hospital commissioning, according to local requirements. We have heard from some that, in attempts to balance their budgets, they sometimes respond to high drug prices by rationing access to other forms of healthcare. Such rationing can affect commissioning of simple elective procedures in hospitals (such as hip operations or cataract removals, which may either be cut or have waiting lists extended) as well as services directly provided by PCOs.
\end{boxedminipage}

\textsuperscript{71} Some proposals for institutional reform are set out in Chapter 6.
The Pharmaceutical Price Regulation Scheme

There are, further, some categories of drugs where rationing takes place on cost grounds. For example, it is likely that access to ‘high-cost’ drugs (meaning high cost per patient rather than by total expenditure) may be directly curtailed as a result of inefficiencies elsewhere in the system. PCTs have mechanisms for restricting access to certain high-cost drugs (in some cases requiring approval of prescribing decisions on an individual basis or only agreeing to fund a certain level of prescribing over a given period). As drugs become increasingly tailored to smaller patient groups and specific genetic profiles, this rationing of access to expensive therapies may become a more significant issue in the future.

While PCOs’ ability to constrain expenditure varies significantly, there is some evidence to suggest that this behaviour has, in aggregate, had a material impact on patients’ access to drugs. An example of restricted access is provided by the anti-TNFα therapies for inflammatory arthritis. In March 2002, NICE approved the use of the ‘anti-TNFs’ for people with severe rheumatoid arthritis for whom alternative treatments had failed. But a survey in 2005 by the British Society for Rheumatology72 found that a third of rheumatologists consulted were prevented from prescribing anti-TNFs in accordance with NICE guidance by PCTs, usually citing resource constraints.

While practice varies between PCOs, many companies have suggested to us that the mechanisms they employ can be fairly blunt and focus more on reducing cost in the short term rather than achieving value for money. This is one of the motivations for using cost effectiveness assessment to inform price directly – to give local decision makers greater assurances that drugs prescribed are cost effective at prevailing prices and to avoid the need for using volume controls to contain expenditure.

In Technology Appraisals, NICE, SMC and AWMSG sometimes reject drugs on the basis of unacceptable cost effectiveness rather than purely on the grounds of insufficient clinical evidence. Examples are given in Annexe B. Difficult choices are, we recognise, inevitable given the limited resources the NHS has at its disposal. In Annexe M, however, we review some drugs for which the ICER may conceivably be higher than for rejected products, but which are currently being prescribed in large volumes.73

Where access is restricted on cost effectiveness grounds, it is vitally important that all drugs – old and new – are assessed on the same basis. This does not happen across the board under current arrangements. To restrict access to new treatments while ignoring inefficiencies in current expenditure is not an efficient use of resources. Nor is it in the interests of patients.

Long-run effects – investment incentives

5.163 If the prices of drugs reflect their value to patients and broader society, companies will be given efficient incentives to invest in pharmaceuticals in the future. These issues are addressed in greater detail in Box 5.3, which reviews some therapeutic areas in which there is unmet demand, shows the importance of UK prices in global demand and hence demonstrates how a value-based approach to pricing could improve incentives to invest in these and other priority areas.

72 The survey was conducted jointly by the BSR and the Arthritis and Musculoskeletal Alliance (ARMA). See http://www.rheumatology.org.uk/public_affairs/armabsntfnfsurvey/

73 We have not calculated the ICERS of any of the products reviewed. However, at the limit, if two products have entirely equivalent benefits for patients, the ICER of the more expensive relative to the cheaper will be infinite. See Annexe B.
Box 5.3: Potential gains from value-based pricing in the long term

When the prices of medicines do not reflect relative therapeutic benefits the investment incentives of firms can be distorted. Specifically, companies may not face strong incentives to invest in drugs that are most beneficial to society and may conversely be encouraged to spend large sums developing products that offer scant improvements to patients over existing alternatives. This can be bad for public health in the long term, leaving patients without effective treatments to combat their diseases.

The World Health Organisation has identified many ‘pharmaceutical gaps’ in serious conditions where it is not profitable for private sector companies to research effective treatments.\(^\text{74}\) Some examples of missing medicines according to the WHO are:

- an effective treatment for acute stroke
- new antibiotics to replace older products rendered ineffective by overuse (and associated microbial resistance)
- antidepressants with proven efficacy in children and the elderly, and
- technologies to complement drugs in many areas, such as a heat-stable formulation of insulin or better diagnostic tools for Alzheimer’s (which could improve understanding of the current generation of controversial drugs where efficacy is debated).

Against this backdrop of need, the drugs that generate the biggest revenues globally tend to be for conditions that are chronic, non-fatal (at least for many patients for a long time) and for which there are several substitute therapies with similar characteristics and efficacy. Examples of such conditions include dyspepsia and high cholesterol. Commentators sometimes call these sorts of pharmaceuticals ‘me-too’ drugs. We do not think it is useful or accurate to divide drugs crudely into ‘innovative’ versus ‘me-too’ categories. Many innovations are incremental in nature, bringing benefits to patient groups that may be poorly served by existing drugs. Such benefits can take the form of more effective treatments or reduced side effects and it is key to securing value for money that any such incremental benefits be reflected in prices.

The concern we address in this report is that, for some drugs we have reviewed, relative price differences do not appear to reflect relative incremental benefits. To the extent to which this is true, prices will be out of line with value and will not give helpful incentives to companies to invest in drugs in the future.

Value-based prices might bring huge gains over time to the extent to which they could drive investment in areas of clinical need. Such gains are clearly difficult to quantify, however, since we do not know today what drugs could be produced tomorrow under helpful incentives. We also recognise that improving investment incentives depends on many variables, not least how pricing regimes around the world interact with countries’ science policies. As well as pricing, other factors in the profitability of drug development include the cost of R&D, which is determined by the regulatory process in leading markets, notably the US and Europe. In the UK the Cooksey review has considered how costs of development could be reduced, and public funds better targeted, so as to improve success prospects for new medicines in some therapeutic areas.

But price is undoubtedly a central concern in getting investment incentives right. UK prices are particularly important in this regard. As noted in Chapter 3, although the UK is a small market in terms of prescription volumes, it exerts a disproportionately strong influence on global prices due to the fact that public health services in many other countries follow the UK’s lead in pricing drugs.

5.164 Several companies indicated to us that they see merit in the principle of value-based pricing, but were concerned at the resource implications of any move in this direction. It is clearly right that reform only be implemented if the benefits outweigh the costs. Accordingly, in Annexe L we have considered the likely costs to the public and private purse of implementing a value-based approach to pricing.

5.165 To be conservative, we attempt to estimate the costs of the most resource-intensive, long term option that we consider in Chapter 6 – namely, the creation of a separate body charged with carrying out both ex ante reviews for all new active substances and ex post reviews covering the all BNF paragraphs over a five year period. In practice, the resource implications may be less than this.

Public resources

5.166 NICE, SMC and AWMSG are natural candidates for conducting the cost effectiveness analysis required to implement value-based pricing. As set out in Annexe B, they represent a combined resource and expertise that is almost certainly unmatched in any other country. NICE’s assessments in particular are considered a gold standard for technology appraisals around the world. But improvements could be made. In particular, the bodies need to coordinate to a greater extent than at present on medicines HTAs, addressing the current situation in which certain drugs are assessed ex ante both through an SMC appraisal and though a NICE STA.

5.167 The institutional proposals we set out in the next chapter are designed to make best use of existing resources through greater coordination while also recognising the proper distinction between devolved and national responsibilities. Annexe L sets out a broad brush estimate of the additional resources these bodies would require to implement our proposals.

5.168 On the basis of the current costs NICE incurs in conducting HTAs, a rough estimate of required annual resources for implementing full ex ante value based pricing would be: 20 ex ante and 30 ‘resource-intensive’ ex post reviews at £150,000 each and 40 less resource-intensive reviews at £75,000, for a total of £10.5m. As discussed in the next chapter, this would be allocated among the three bodies in accordance with their workload. This compares with NICE’s current expenditure on HTAs of £4.5m per year.

5.169 Therefore, the option would represent an increase in expenditure among the existing bodies of less than £6m, taking into account the fact that the existing resources of SMC in particular (on which we do not have budgetary information) would make a significant contribution to the workload. As explained in Annexe L, we also think resources elsewhere in the NHS could be freed up through the use of value-based prices, further reducing costs, although we have not attempted to quantify these benefits.

5.170 Under the medium term approach set out in Chapter 6, a separate pricing unit within DH would carry out the pricing reviews on the basis of a cost effectiveness assessment. Staff within the current PPRS team and Commercial Directorates would be natural candidates to staff the unit, as they are used to price negotiations with manufacturers and also have an informed sensibility to the wider policy setup of the NHS. We have assumed an additional £500,000 per year to meet additional resource requirements for the unit. This would bring the estimate of total costs required to a maximum of £11m and of additional resources required to a maximum of £6.5m per year. Again as discussed in Annexe L, these are generous resources compared to those employed in other countries that employ value-based pricing methods.
5.171 Needless to say, these are broadbrush estimates and would need to be worked up in full were our recommendations to be implemented. However, it is clear that even a fraction of the potential efficiencies suggested by our indicative review above dwarf the likely extra financial costs of setting up institutions to run a value-based pricing system even under the most resource intensive approach.

**Private Sector Resources**

5.172 As well as considering the resource implications of a value-based pricing system on the public sector bodies responsible for its implementation, costs to pharmaceutical companies should also be considered. Costs to pharmaceutical companies of submitting information to cost-effectiveness evaluation bodies may increase as more reviews would be required per year under a value-based pricing system.

5.173 However, some of these costs would be offset as under the proposed system companies would only be required to submit ex ante reviews to a single cost-effectiveness body. This contrasts with the current system, in which they are required to submit to two different bodies (SMC and NICE through the STA process), which have differing processes of evaluation, thus requiring potentially differing submissions.

5.174 More importantly, more efficient price structures should result in better incentives for efficient marketing and thus lower marketing costs. In fact we believe any increases in required informational expenditure caused by a move to value-based pricing could entirely be offset by reduced marketing costs. That is, resources could be reallocated from marketing to submission of cost effectiveness information on drugs. It would require a relatively small reallocation of marketing spend to achieve this: in 2004, £850m was spent by AFR companies on marketing drugs in the UK.

5.175 We recognise, however, that, in a more value-conscious NHS, it is important to support companies in developing robust cases for the cost-effectiveness of their products. Several recommendations to help companies do so are discussed in the recent Cooksey Review of UK health research funding (December 2006). We welcome the recommendations of the Cooksey Review and see them as a natural complement to a value-based approach to pricing. The review and its relationship to value-based pricing is discussed further in box 5.4.

**Box 5.4: Value-based pricing and the Cooksey Review**

The Cooksey Review has explored ways of increasing the rate at which basic research translates into healthcare interventions yielding clinical and economic benefits. On the subject of drug development the Review identifies a number of challenges in bringing new products to market.

The Review explains how developing a new drug has become an increasingly costly undertaking in recent years, in part due to the informational demands placed on manufacturers:

- the licensing process has become lengthier and more complex, increasing costs of compliance and reducing the effective patent life of a typical new medicine at launch, and
- Health Technology Assessment (HTA) by NICE, SMC and AWMSG adds further costs of compliance at the end of the development process.
Other trends have also contributed to diminishing the profitability of innovation, such as a move towards developing more ‘personalised’ medicines that treat subgroups of patients with a condition (such as specific genetic types). Development costs per patient treated can be higher for products with small markets than for the last generation of ‘blockbuster’ drugs for widespread chronic conditions such as cholesterol, hypertension or dyspepsia – where ‘easy wins’ in terms of medical breakthroughs have mostly been had.

To reduce the average cost of developing a new chemical entity, major challenges will be to reduce the failure rate of candidate molecules – at least those reaching relatively late stages of development – and to increase the uptake and profitability of truly useful new drugs. To meet these challenges of easing ‘the critical path’ of drug discovery, both licensing authorities and the NHS, on the one hand, and the pharmaceutical industry, on the other, will need to show flexibility and address their appetites for risk.

The Cooksey Review calls for several new arrangements to ease the critical path, including:

- a systematic programme of pilot studies of conditional licensing for new drugs at relatively early stages, allowing for initial use by specialists but not GPs
- a more thoroughgoing approach to HTA, expanding it to cover a greater proportion of NHS activities and introducing assessment earlier in the development process
- the creation of disease registries within the NHS HTA programme, to enable more effective tracking of the safety and efficacy of drugs in practice, where issues such as patient compliance and off-label prescribing can inform relatively low-cost research to augment the clinical value of drugs, and
- use of the forthcoming NHS National Programme for IT (NPfIT) to automate and expand on the measures described above.

Value-based pricing would be supported by the measures outlined above, all of which would generate more information, and earlier, about drugs than is available at present.

Conclusion

5.176 We believe there is a compelling case for adopting a value-based approach to pricing within the PPRS, as the best available means of delivering the high-level objectives of the scheme of securing value for money for the NHS whilst providing appropriate incentives for manufacturers to invest in beneficial drugs in the future.

5.177 In this respect, we believe either Options two or three would represent a significant improvement on current arrangements. Taking up the system of ex-post reviews proposed in option two would involve fewer changes compared to today and allow companies commercial freedom in pricing newly launched drugs, but the trade-off would be a delay in achieving value-reflective prices and, possibly, delays in the uptake of cost effective treatments.

5.178 The ex ante value-based approach in Option three addresses these concerns and is therefore our preferred option. Fast track ex ante assessments would provide a rapid, pragmatic approach for most drugs. The option to pursue a risk-sharing contract offers the promise of being able to assess the therapeutic benefits of individual drugs in the most open-minded and case-specific way possible but would call for more administration and negotiation.
5.179 However, in the discussion above we argue that the NHS and other UK public bodies – including NICE, SMC and AWMSG – possess ample specialist clinicians and expertise in Health Technology Assessment (HTA) compared to numerous other countries that appraise every new drug at launch and review public reimbursement listings annually. The additional funding we estimate would be required to implement ex ante value based pricing would result in an overall resource base that would be far more generous than that currently employed in these other countries. The greater robustness and rigour of HTA in the UK would therefore be maintained under our proposed reforms.

5.180 In the next Chapter we consider how the institutional framework to implement our proposals could be structured in the short and long term. To allow reasonable time for a new system to be implemented, we propose that the reforms proposed in Option three commence from 2010, when the current PPRS is due to expire.
6 RECOMMENDATIONS AND INSTITUTIONAL FRAMEWORK

Summary of recommendations

6.1 We recommend that Government work towards reforming the PPRS, replacing the existing profit cap and price cuts with a value-based approach to pricing. We believe that both of the value-based pricing options we have identified would be a major improvement on current pricing arrangements, helping to secure value for money for the NHS and avoiding the increasingly arbitrary nature of PPRS controls.

6.2 However, in our opinion the best long-term arrangement for the UK would be Option three: to replace PPRS profit controls and price cuts with an ex ante value-based approach to pricing.

6.3 For standard branded generics for which there is a bioequivalent generic supply subject to Category M pricing, pharmacies should be reimbursed at the Category M generic price.

6.4 For originator brands for which there is a Category M equivalent, pharmacies should be reimbursed at the Category M generic price (plus a maximum of 25 per cent).

Institutional and legal framework

6.5 The rest of this chapter sets out a proposed legal and institutional framework to administer our recommended option for reform of the PPRS. We focus on the framework for the operation of a fully reformed value-based PPRS over the medium and long term, starting from when a new scheme would be renegotiated, in 2010.

6.6 Most companies have told us that it would be a mistake to introduce wholesale reform overnight. We agree. We recognise that new institutions and procedures cannot be introduced precipitously, without a risk of undermining the quality of analysis and robustness of process on which a successful value-based approach to pricing depends.

6.7 We recognise that there are provisions for conducting a Mid-Term Review of the scheme as set out in Section 6 of the agreement:

‘6.1: In the event of major changes affecting the supply of medicines to the NHS, either party may request an interim review after two and a half years. Following such a review the terms of the scheme may be varied with the agreement of the ABPI and the Secretary of State.

6.2: If the terms of this scheme are altered with the agreement of the ABPI and Secretary of State, companies will be invited to accept the new terms. They will have the option of leaving the scheme as set out in Chapter 9.’

6.8 Whether to implement such an option is a matter for Government and ABPI to consider. If this option were adopted, it might be possible to phase in arrangements on a transitional basis. Any such approach would have to be discussed between industry and Government, however.

6.9 Rather, the focus of this annexe is on medium and long term arrangements, during which, under our preferred approach, profit controls and price cuts would be phased out and replaced by:

- ex ante reviews to be conducted for all New Active Substances coming onto the market, and
- ex post reviews to be conducted of all drug categories over a five year period.\(^{75}\)

As noted, some of these reviews, covering paragraphs that are uncontroversial or account for low levels of expenditure, would be very light touch.
The medium term

6.10 We propose that under a fully reformed PPRS starting from 2010, maximum prices for branded drugs would be set on value-based principles. The cost effectiveness analysis required to form a view on value-reflective prices would be undertaken by NICE, SMC and AWMSG. The work between the bodies would be coordinated by agreement between the UK health departments.

6.11 In the medium term, these bodies would not be able to set prices or make reimbursement decisions on their own account. Any revised NHS list prices or rebate regime would have to be formally negotiated with companies by the Secretary of State for Health. In practice, we propose that a pricing unit within DH carry out this task, on the basis of analysis carried out by NICE, SMC and AWMSG.

6.12 Part of the appeal of this framework is its practicality since it would be unlikely to require new legislation. It reflects the fact that pricing decisions are not devolved, but are made at a UK level. At the same time, most aspects of devolved arrangements would be untouched because devolved bodies would continue to exist in their present form.

6.13 We believe that there are important benefits to this since NICE, SMC and AWMSG have built up institutional expertise and credibility within the UK – indeed we heard repeatedly on case study trips undertaken for this study (see Annexe K) that NICE is increasingly perceived as a world-class HTA body. Thus we propose that the pharmaceutical appraisal activities undertaken by NICE, SMC and AWMSG would be coordinated through a UK-wide programme of drug appraisals, to ensure efficient use of these resources. The other activities of NICE and the work of SIGN in Scotland would be unaffected.

6.14 Clinical guidelines (as produced by NICE and SIGN, for example) would have the same purpose and status as at present. Pricing negotiations for branded drugs should inform, but be conceptually separate from, broader views of appropriate care across entire clinical pathways. There will be a case for close coordination between SMC and SIGN, to ensure that clinical guidelines reflect not just clinical but cost effectiveness considerations. All non-medicines guidance would continue to be produced on a devolved level.

6.15 We envisage that the DH pricing unit would be staffed primarily by staff from the current PPRS team and the Commercial Directorate, given the experience of both in company negotiations and medicines policy.

Overview of the medium-term scheme in practice

6.16 The proposed operation of the scheme in practice is set out in Figure 6.1 overleaf.

6.17 NICE, SMC and AWMSG would undertake the cost effectiveness analysis needed for ex-ante pricing and associated ex post reviews as well as risk-sharing schemes. For each drug appraised, one of the bodies would take a view on a cost effective price but pass its conclusions to a pricing unit in DH to negotiate the final terms with manufacturers, on behalf of the devolved health departments.

---

76 We believe that there are good reasons for this – multiple prices within the UK would lead to problems of parallel trade, creating supply side instability.

77 NICE, for example, would continue to produce guidance on interventional procedures, public health promotion activities and devices.
6.18 The key challenges to be addressed in such a system, which would make use of existing cost effectiveness bodies to inform pricing decisions, is how to ensure coordination of effort and consistency of approach.

Figure 6.1: Possible pricing arrangements in the medium term

6.19 Given the volumes of work generated by assessing all drugs on value-based principles, the devolved health departments would agree on a work programme to divide up assessments between the three bodies. This coordination mechanism would avoid duplication of effort and ensure that best use is made of existing resources in conducting HTA assessments.

6.20 A further advantage to any system under which all drugs would be assessed by NICE, SMC and AWMSG would come from removing the need for the current referrals process by which NICE is passed drugs to assess by DH. The process of deciding which drugs are to be assessed by NICE, described in Annexe B of this report, is itself time-consuming.

6.21 The need to achieve consistency of approach is central if key stakeholders are to have confidence in a value-based pricing system. We recognise, however, that significant differences in approaches currently exist between the three bodies. Under current arrangements, there are differences in terms of which types of drugs are reviewed and how the HTA process is carried out by the bodies. As discussed in Annexe B, the approach of NICE is generally regarded to provide the most in-depth and robust analysis.

6.22 In the short run, a pragmatic solution would be to make best use of the respective strengths of the bodies in the allocation of assessments through the work programme. As noted, assessments will vary significantly in terms of complexity of analysis required and resource input needed. For instance, a review of an uncontroversial class of established drugs or the assessment of a new strength of an existing medicine may be relatively straightforward and could be conducted using a lighter touch approach. Alternatively, a new class of innovative drugs or a complicated treatment class may require a more robust, in-depth assessment. The division of work between the bodies should take account of these resource differences. This does not imply inconsistency but rather a proportionate use of resources.
6.23 A UK-wide programme of drug appraisals, however, implies the need for greater coordination and consistency in the approach adopted by the bodies. We think a useful measure could be the establishment of an ‘HTA Pharmaceutical Forum’ as part of the medium term approach to value based pricing. NICE could initially host this forum, which would give the bodies an opportunity to discuss HTA issues arising from their input into the pricing process. The bodies could benefit from information exchange (e.g. methodologies) to better inform their work, which could lead to improved and more harmonised approaches where needed.

6.24 The work programme would set out in principle how ex ante and ex post appraisals would be divided between NICE, SMC and AWMSG although officials in the UK Departments of Health may need to show flexibility when assigning individual appraisals, according to short-term capacity constraints. We would not wish to pre-empt decisions on the division of economic modelling, but certain ways of working suggest themselves. NICE and SMC currently review drugs at launch, and so between them already have well developed skills and processes to conduct the analysis to inform ex-ante price setting required under our preferred option for reform. NICE and AWMSG, and the academic centres, which today undertake in-depth evaluations of drugs that have been on the market for some time, have the skills needed to manage ex-post reviews and risk-sharing schemes. Further, the in-depth assessment of NICE might be more be more appropriate for evaluation of some of the more challenging NAS, while the more rapid, less resource-intensive approach of SMC and AWMSG would be suited for swift reviews of less controversial areas.

6.25 In practice, the scheme would work as follows for new drugs. A manufacturer would submit a proposed price to NICE, SMC or AWMSG, along with relevant cost effectiveness evidence. This would require the early stage engagement between manufacturers and NICE, SMC and AWMSG that the Cooksey review has recommended, as discussed above.

6.26 If the appraising body considered that, at the given price, the evidence indicated the drug would fall below the relevant cost effectiveness threshold in all indications, the drug would be recommended to the NHS. Recommendations would take the form of guidance similar to that issued today by the SMC (and NICE through the STA process) in the assessment of new drugs at launch.

6.27 If the drug fell above the relevant threshold in some or all indications, the appraising body would publish an assessment indicating its view of the maximum acceptable price (in each indication if the prices varied). This information would inform the subsequent price negotiation that would be carried out by DH.

6.28 If the appraising body determined that there was sufficient uncertainty about outcomes, there would be an opportunity to consider risk-sharing or ‘only in research’ recommendations. The appraising body would publish its view to inform DH’s pricing negotiations. The published assessment might include estimated volumes for each indication and, in the case of a risk-sharing contract, the clinical data that would be required to inform future assessment.

6.29 Once DH received the appraising body’s view, the DH pricing unit would then attempt to negotiate an agreement on the basis of the evidence provided by NICE, SMC or AWMSG. It would negotiate with manufacturers on both price level and structure, which may include, for example, rebates, or brand premiums.

6.30 Once a pricing decision was reached between DH and the manufacturer, the drug would be included in the NHS for reimbursement. At this stage, the appraising body that conducted the initial cost effectiveness appraisal would issue guidance on the use of the drug to the NHS to
aid prescribers and to inform future clinical guidelines. An agreement would be required whereby the guidance of each of the bodies would apply across the UK. 78

6.31 We believe this transparency should give prescribers and health authorities greater confidence that any future prescribing would be cost effective, which should in turn improve uptake. The ability to negotiate an appropriate price structure should mean that restricted recommendations would be less frequent under a value-based PPRS. However, the facility to issue restricted recommendations would still exist.

6.32 Where an agreement between the manufacturer and the pricing unit could not be reached, NICE, SMC and AWMSG would issue negative guidance. For new drugs in this situation, reimbursement would be refused by the Secretary of State.

6.33 In all cases, but especially those where refusal of reimbursement would be a realistic prospect, it would be important to have in place an appropriate appeals process for cost effectiveness decisions issued by NICE, SMC and AWMSG. As under current arrangements, the appeals process would be internal to existing bodies.

6.34 Similarly, an appeals system would need to be in place for price negotiations between DH and the manufacturer. This accountability mechanism would promote stability and transparency in the new pricing and reimbursement process.

6.35 In addition, any pricing scheme in an EU member state must be compliant with EC legislation, including the EC Directive relating to the transparency of measures regulating the pricing of medicinal products for human use and their inclusion in the scope of national health insurance systems (Directive 89/105/EEC the 'Transparency Directive') and provisions in relation to State Aid, competition law and the free movement of goods. Certain decisions taken under a UK pricing scheme would, potentially, also be open to the scrutiny of judicial review.

6.36 In practice, as elaborated upon in Annex G, the Transparency Directive is not prescriptive as to the particular form of a pricing scheme, but rather sets the high level principles to which it should adhere – in particular that pricing and reimbursement decisions should be made on the basis of ‘objective and verifiable criteria’. It also imposes certain procedural requirements. Almost all cases successfully brought under the Transparency Directive have related to a failure to keep within the prescribed time limits or to provide reasons for decisions.

6.37 This objective could therefore be met by a wide variety of forms of pricing scheme, providing the institutions that implement them had robust and fair processes.

78 There are precedents for such agreements. Since the establishment of a formal link with NICE in July 2006, guidance from NICE is to be implemented in Northern Ireland and NICE interventional procedures cover the whole of the UK.

79 Of particular relevance in interpreting this requirement is UK (R (on the application of Pfizer Ltd.) v. Secretary of State for Health [2003] 1CMLR 19 in which Court of Appeal was asked to consider the decision of the Secretary of State that Viagra was not to be reimbursed on the NHS. It was alleged that the decision to restrict the use of Viagra, on the basis not of clinical or cost-effectiveness but rather on the Secretary of State’s assessing the need it addressed as having a lower priority than other calls on NHS funds, failed to contain a statement of reasons “based on objective and verifiable criteria” as required by Article 7. Lord Justice Brown held on the contrary that, “For the criteria to be ‘verifiable’, all that is necessary is that they should be published and available, in particular to would-be importers, to satisfy themselves that they do not contain disguised restrictions on intra-Community trade. And the measures are ‘objective’, in the sense used by the Court in Duphar, if they are based on a legitimate aim, that of improving the economics of the state health system.”

80 Annex G provides further details.
6.38 We would expect that, at least in the short run, the period for drug review would not be significantly different from the current time lines in place. There may be economies of scale as the bodies expand their scope and role in the drug review process. The pricing decisions would need to be well coordinated with the appraising bodies to ensure that HTA assessments, pricing and reimbursement decisions were carried out in a timely manner. Some assessments could in principle be produced within a few weeks of a marketing authorisation being issued. To achieve this would require the early stage engagement between manufacturers and NICE, SMC and AWMSG that the Cooksey review has recommended.

6.39 Once an agreement on prices had been reached between a company and the DH pricing unit, we would envisage that the company would not be able to increase prices unless or until a further review had been carried out.

6.40 As regards products on the market at the time our proposed reforms would begin to operate, we would envisage that their reimbursement prices would remain at then prevailing levels until reviewed by NICE, SMC or AWMSG. This would mean that such products would not be subject to further price cuts, but also that their prices could not be increased until such a change had been demonstrated to be cost effective. There would be no price modulation under this system.

**Legal status of the medium term**

6.41 The Health Act 1999 currently, but from 1 March 2007 the National Health Service Act 2006 (‘NHS Act 2006’), enables the Secretary of State to make a statutory scheme replacing the PPRS or to negotiate any other voluntary agreement with the pharmaceutical industry, for the purpose of limiting prices or profits of manufacturers or suppliers of NHS medicines across the UK.\(^81\)

6.42 It would be desirable for arrangements for the medium term to be negotiated through a voluntary agreement between ABPI and the UK Health Departments. We consider the likely status and content of any such scheme at the end of this chapter. If this were not possible, the Secretary of State could use the NHS Act 2006 powers to establish a statutory scheme.

6.43 The institutional framework set out here would therefore rely on existing legislation. Pricing would rely only on powers already held by the Secretary of State under the NHS Act 2006.

6.44 In relation to the mechanism for ensuring coordination between the three cost effectiveness bodies, the legal situation is relatively clear for NICE and SMC but somewhat less so for AWMSG.

6.45 In respect of NICE, section 28 of the NHS Act 2006 (replacing section 11 of the NHS Act 1977 from 1 March 2007), permits the Secretary of State to ‘...make such further provision relating to a body established under subsection (1) as he considers appropriate.’ These powers apply to NICE and would seem to be sufficiently broadly worded so as to permit provision to be made as to NICE co-operating with SMC and AWMSG.

---

\(^{81}\) Health Act 1999 section 35, read with section 38. To be replaced from 1 March 2007 by NHS Act 2006 section 263, read with section 266. See Annexe G for details.
6.46 With regard to SMC, acting essentially as a consortium of Scotland’s Health Boards, section 2(5) of the NHS (Scotland) Act 1978 provides the means by which its relationship with other bodies can be legislated for.82

6.47 The legal situation of AWMSG is less clear because it is not covered explicitly by legislation in the way that NICE and SMC are. As with the other bodies, AWMSG would need to agree to participate in the reforms to the PPRS proposed here. Further steps to formalise the relationship would include securing agreement from the Welsh Assembly Government Health Department.

**Longer-term options**

6.48 Into the longer term it may be considered desirable to extend the joint working arrangements proposed above. This section briefly considers the issues. We stress, however, that these ideas represent only one option for a long-term direction of travel and would not be desirable before the arrangements proposed above had bedded down. Any transition would be necessarily gradual.

6.49 One longer term option would be to formalise the coordination between NICE, SMC and AWMSG through the creation of a Commission on the Value of Medicines (CVM) that would direct the HTA activities of NICE, SMC and AWMSG. Pricing would continue to be carried out by DH using the Secretary of State’s powers under the NHS Act 2006. Ultimately the Commission could take over the responsibility for negotiating prices with manufacturers, becoming an independent Medicines Pricing Commission (MPC). While establishing the CVM may require only secondary legislation, the MPC would need to be underpinned by primary legislation. We discuss these institutional proposals in turn.

**Commission on the Value of Medicines**

6.50 The CVM would comprise members drawn from NICE, SMC, AWMSG, the MHRA and other institutions, ensuring that all four countries of the UK were represented. Further members relevant to specific decisions, such as clinical and academic specialists in specific disease areas, would be drawn in on a case-by-case basis from a list of accredited individuals. Preferably, at least one clinician, one pharmacist and one pharmacologist would contribute to the price recommendation for every drug considered. All members of the commission would be required to be free of conflicts of interest.

6.51 Detailed economic evaluation would continue to be carried out by NICE, SMC, AWMSG and the academic centres as an input into the decision making of the CVM. Common standards governing their processes would be developed through the CVM. Clinical evaluation would be carried out by specialists from the NHS as at present. To ensure consistency in viewpoints, existing and new clinical networks would appoint liaison members to inform CVM decisions.83

6.52 The CVM would retain many of the advantages of our proposals for reform outlined above. For example it would help ensure efficient use of HTA assessment resources across the UK, while reflecting the legitimate desire to have many important functions – notably the provision of clinical guidelines to prescribers – produced at a devolved level. Bodies from the separate countries of the UK, such as NICE, SMC and AWMSG, would directly influence prices across the UK but continue to exist in their present form.

82 ‘In carrying out the purposes mentioned in subsection (1) and in exercising any function otherwise conferred on them by or under this Act each Health Board shall act subject to, and in accordance with, such regulations as may be made, and such directions as may be given, by the Secretary of State; and such regulations and directions may be made or given generally or to meet the circumstances of a particular area or matter.’

83 Many clinical networks exist in the NHS, from local initiatives to those for major conditions such as heart disease and cancer, led (in England) by National Directors.
6.53 The figure below illustrates how the CVM might work in practice. The model of an independent body providing cost effectiveness evaluations as an input into the pricing decision of a separate authority is one that has been employed to good effect elsewhere, notably Australia (see Annexe K).

Figure 6.2: Commission on the Value of Medicines

Medicines Pricing Commission

6.54 A longer term option would be for the MPC to replace the CVM as a body with legal authority for making pricing and reimbursement decisions. In principle, a number of measures could be used to underpin the independence of the MPC. Principles for appointing and dismissing members and their length of tenure could be set out in legislation, for example. There may be a case, with a genuinely independent MPC, for a separate appeals panel to consider contested decisions.

6.55 The revised process is shown in the diagram below, which illustrates how the MPC would work in practice.
The case for an independent pricing body

6.56 There are arguments for and against a fully independent MPC. In principle, it seems reasonable to strive to remove political influence from essentially technocratic decisions on the consistent pricing of the clinical value of medicines – which can only properly be determined by specialists.

6.57 Furthermore an independent pricing body could help create stability and improve investment incentives by providing a mechanism by which Government could credibly commit to paying reasonable prices to companies in the future. In a variety of policy fields, Governments have successfully created independent bodies with clear objectives set down in statute in attempt to improve dynamic incentives. The Bank of England and independent utility regulators provide examples. Creating an independent pharmaceutical pricing body would be consistent with this broader trend towards the use of constrained discretion in policy making. It would also be consonant with the thrust of recent policy proposals in relation to the health service: these have suggested that the NHS should be run more independently of ministerial intervention, through the establishment of an NHS board.

6.58 However, we regard this framework as a long-term possibility for a number of reasons. First, it would require legislation to implement – both to give the body, on a UK wide basis, pricing and reimbursement powers currently accorded to the Secretary of State and to bolster its independent status, as set out above.

84 Commitment problems are discussed in greater length in Annexe L.
Second, while some companies have seen merit in the creation of an independent body in principle, it would take time for the policies and processes of a new PPRS, and the working practices of the CVM, to establish a track-record of credibility and fairness with companies. Once pricing decisions had been shown to be robust and fair and, ideally, to improve uptake of cost effective medicines in the NHS, moving to an independent structure would be more tenable.

Third, the current expertise of the main constituent bodies of the Commission is in the field of technical analysis and assessment rather than commercial decision making. It would therefore take the body time to build up the capacity for commercial negotiations.

Ultimately, we think that either model set out here – either the medium term or long term approach – could work. There are examples of effective systems in other countries based on either of these approaches (see Annexe K).

**Policy input and the role of PPRS**

In both the medium term and long term structures, we think there could be an important role for a PPRS-style agreement between industry and Government, to provide high-level input into pharmaceutical pricing and reimbursement arrangements.

A value-based PPRS would clearly be a different sort of document to the present agreement, containing high level principles for the conduct of reviews and setting out certain key parameters. Perhaps the most important among these would be the cost/QALY threshold that should apply to assessments. Annexe L of this report gives some considerations as to the factors that should be taken into account in setting this threshold.

We think it is appropriate that this threshold be determined in discussion between industry and Government, given the significant impact it has on NHS expenditure and companies revenues. This would become increasingly important under any system in which pricing and reimbursement decisions are delegated entirely to an independent authority.

Other matters that might be set out in a PPRS agreement might be which costs and benefits to consider in the assessment of the cost effectiveness of a medicine (for example, whether to include benefits to carers and whether to include non-NHS costs) and priorities of social equity such as the appropriate treatment of orphan medicines.

The document would therefore be a higher level policy document than at present. It would not be prescriptive as to the details of the methodologies and procedures to be followed by the Commission – these would be set out in guidance that the Commission itself would issue. Moreover, it would not provide the main mechanism for enforcing decisions – in most cases the bargaining position of the payer would be underwritten by the ability to refuse reimbursement or, in the case of the risk sharing approach – through separate contractual mechanisms.

Under current arrangements it seems to us to be exposing NICE, SMC and AWMSG to excessive pressure to expect them to develop an appropriate cost effectiveness threshold without guidance or input from central Government.

An alternative approach is that the body be allocated a fixed drug budget (the size of which would be determined through periodic negotiations), from which a cost / QALY would be derived. The arguments for and against this approach were discussed in Chapter 5. As noted there, we think it is an option that should be seriously considered for the long run.
6.67 The PPRS would, rather, constitute a broad framework agreement within which more specific pieces of guidance operated and individual contracts negotiated. Negotiations would take place every five years or so, as at present. The scheme would therefore continue to provide a forum for industry / government dialogue, an aspect of current PPRS arrangements that many companies value.

Conclusion

6.68 The medium and long term arrangements proposed here would provide a practical basis for implementing a value-based pricing regime in the UK, ensuring efficient use of HTA assessment resources across the country, while reflecting the legitimate desire to have many important functions carried out at a devolved level. By building on existing expertise within the NHS we believe they will provide a robust and flexible framework for a new, value-based PPRS in the long term, delivering benefits to patients and innovative companies alike.