Rev Ind Organ (2018) 52:589–602
https://doi.org/10.1007/s11151-018-9616-1

Value Based Pricing of Pharmaceuticals in the US and UK: Does Centralized Cost Effectiveness Analysis Matter?

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Published online: 9 February 2018

Abstract Increasingly, government policies directed towards limiting pharmaceutical prices have emphasized value-based criteria. This regulatory approach is most clearly formalized in the United Kingdom where the National Institute for Health and Clinical Excellence (NICE) was created within the British National Health Service (NHS), whose function is to apply cost-effectiveness analysis to new drugs. In contrast to Britain, there is no formal regulatory mechanism assuring cost-effectiveness in the United States. Instead, questions of cost effectiveness are left to market processes. In this paper, we examine the pricing implications of these alternate regimes. From our empirical analysis, we conclude that value-based pricing is enforced by both regulatory and market processes, and with similar outcomes.

Keywords Drug prices · Value-based pricing · Cost-effectiviness analysis

1 Introduction

Among Scherer's major research areas is the economics of the pharmaceutical industry. He returned frequently to the particular issues found in that industry. In addition to his many specific research findings, he produced two lengthy and detailed handbook chapters: "The pharmaceutical industry" (2000); "Pharmaceutical innovation" (2010). Both chapters combine insightful commentary on existing literature along with presentations of the author's new findings.

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Among the issues that were emphasized in his first Handbook chapter is a review of the various means that have been used to regulate drug pricing outside the United States. These include the following alternatives:

- International price comparisons so that a country's drug prices are set according to those in other "reference" countries.
- Administrative price setting that employs product criteria such as a product's novelty and perhaps also the manufacture's nationality.
- Administrative price that is based on argument and persuasion—especially for highly profitable products.
- Administrative price setting with prices linked to overall firm profitability rather than to individual products.

Following his review, Scherer (2000, p. 1331) summarized his conclusions in the following statement:

> Efforts by national authorities to curb pharmaceutical costs and offset the demand-increasing effects of generous health care insurance by imposing drug price controls are found throughout the industrialized and less-developed world. These sometime succeed in their proximate goal, but cause bulges in other parts of their health care balloon, bias new research and development incentives, and distort international trade and investment patterns.

Scherer's point is that—despite their laudatory goals—regulatory actions may create economic distortions even when successful in achieving their primary objective.

Increasingly, government policies that are directed towards limiting pharmaceutical prices have emphasized value-based criteria. Price levels should be supported, many argue, only when justified by therapeutic improvements but not otherwise. Particularly since pharmaceuticals are increasingly paid from public funds, national health authorities should make certain that value is received for the outlays involved. While this judgment directly applies to the developed countries of Europe and Asia, it is increasingly relevant for the United States where nearly 40% of all prescriptions filled currently are paid through the Medicare and Medicaid programs (IMS 2015, p. 45).

This regulatory approach is most clearly formalized in the United Kingdom where the National Institute for Health and Clinical Excellence (NICE) was created within the British National Health Service (NHS). Its assigned function was specifically to apply cost-effectiveness analysis to new drugs along with other medical interventions. New drugs specifically would be judged as cost effective or not, and then the NHS would provide reimbursement support only for pharmaceuticals which had passed this test. Through this mechanism, the therapeutic value of new drugs would be assured.

Critically, when making its determinations of whether new drugs are cost effective, NICE considers the drug company's prices as fixed. Indeed its officials assert they have no effect on prices (George 2010).

In contrast to Britain, there is no formal regulatory mechanism that assures cost-effectiveness in the United States. While the primary regulatory authority that deals with pharmaceuticals—the US Food and Drug Administration (FDA)—is required to certify the safety and efficacy of all new pharmaceuticals, its mandate does not apply to prices. Furthermore, the Medicare authority is not authorized to negotiate prices centrally with drug manufacturers (Schweitzer 2007, pp. 218, 219). In this manner, questions of cost effectiveness are specifically left to market processes.

In this paper, we examine the pricing implications of these alternate regimes. We ask whether the explicit attention that is paid in the UK to questions of cost-effectiveness matter. Our essential hypothesis is that value-based pricing is enforced by both regulatory and market processes, and with similar outcomes.

2 Cost Effectiveness Analysis

Cost effectiveness analysis is an established tool used to evaluate the outcomes and costs of medicinal interventions (Gold et al. 1996). Its purpose is to determine whether value is received for the interventions that are purchased. Unlike cost–benefit analysis, outcomes are not assigned a monetary value but instead are represented by specific therapeutic outcomes.

Where interventions are used to improve health outcomes, a commonly used measure is quality-adjusted life years, or QALYs. This measure adjusts the number of life-years that are extended through a medical intervention by an index of the quality of life (Drummond et al. 1987). Interventions are considered cost-effective if their cost per QALY is no greater than a pre-specified value, where the latter is influenced by the decision-maker's budget constraint.

There are two components to cost effectiveness analysis: a drug's effectiveness and its cost per intervention. The critical assumption in this approach is that both factors are exogenous and not influenced by the analysis itself. While that assumption may be valid for evidence on a drug's effectiveness, it is surely **not** adequate when considering factors that affect pharmaceutical prices. The essential point is that all drugs are cost-effective—so long as they are not harmful—at some price. Suppliers can always find a price at which their products are cost effective.

We are hardly the first to make this point. See for example Jena and Philipson (2013, p. 173) who suggest that "manufacturers may find it in their best interest to price up to that [cost effectiveness] threshold regardless of production costs". To be sure, drug companies may also find it necessary to price down to that threshold. Indeed, a recent joint statement by the UK Department of Health and the British pharmaceutical industry specifically acknowledged that "prices at launch will be set at a level that is close to their expected value as assessed by NICE" (Department of Health and the Association of the British Pharmaceutical Industry 2013, p. 43).

Suppose that a prospective drug would not be authorized for use by a particular class of patients unless it is judged as cost-effective. Then the seller's purpose is to set a price that just meets the buyer's standard, depending on the product's effectiveness. Its goal is to set the highest price possible but still have the drug pass its regulatory threshold. In these circumstances, cost effectiveness analysis merely

provides a setting in which the product's effectiveness is evaluated. It establishes the context within which value based prices are set.

This point is demonstrated in the following simple model of a profit-maximizing pharmaceutical firm that is subject to a cost-effectiveness constraint.

Let NICE set a required standard for cost-effectiveness (CE) at £30,000 per QALY gained, indicated here by (30/Q)*. A firm that wants to have its drug sold in the UK must then demonstrate that its CE ratio of P/Q equals or is less than (30/Q)* (where Q is the gain in QALYs associated with a single course of treatment with its drug):

$$P/Q \leq (30/Q)* \tag{1}$$

Let the drug company's demand function, D, equal N if approved, where N equals the number of treatments that are sold if the drug receives CE status, which is independent of the price charged. And let the demand function equal 0 otherwise:

$$\begin{aligned} &D = N \text{ if approved} \\ &D = 0 \text{ if not approved} \end{aligned} \tag{2}$$

The company's short run cost function is given by [C(N) + F], where F are fixed costs which are relatively high. Furthermore, let P be the price per treatment. We assume for convenience the absence of co-payments and also that all medically necessary drugs are provided.

The drug firm is then operating under the regulatory constraint that is given in expression (1). It maximizes profits through the Lagrangian expression:

$$L = PN - C(N) - F + \lambda[P - (30/Q^*)Q]. \tag{3}$$

The firm maximizes profits as follows:

$$\begin{aligned} &\partial L/\partial P = N + P(\partial N/\partial P) - (\partial C/\partial N) \quad (\partial N/\partial P) + \lambda = 0; \text{ and} \\ &\partial L/\partial \lambda = P - (30/Q^*)Q = 0; \text{ so that } P = (30/Q^*)Q. \end{aligned} \tag{4}$$

There are three conclusions to be drawn from this simple model:

(a) Price depends on the level of Q gained from the treatment, so that value-based pricing is enforced by profit-maximizing behavior.
(b) Price is set at the maximum amount that meets the regulatory condition for cost effectiveness.
(c) Higher regulatory standards lead to higher prices without increasing availability so long as marginal costs are low.

There are however additional factors that lie beyond the limits of this model. While the model applies to single market outcomes, drug companies operate in a large number of national markets whose prices are often interdependent. In particular, external reference pricing is frequently used by national health systems to prevent their prices from exceeding those paid elsewhere. A manufacturer is

therefore reticent to negotiate a low price with one buyer if it leads to lower prices that are paid by other national systems.

3 The British Regulatory Structure

NICE was established by the British Ministry of Health in the latter 1990s as an explicit effort to include cost effectiveness analysis in government purchasing decisions for pharmaceuticals and other medical interventions. Its first appraisals were carried out in 2000, and about 184 appraisals were published through November 2009. Drug manufacturers are required to submit cost-effectiveness studies for selected products, which are then evaluated by NICE consultants.

Following their review of the submitted material, the consultants meet with NICE officials; and their recommendations form the basis from which specific judgments are made. These judgments take the form of "yes," "partial yes" and "no". Less than 30% receive an outright "yes"; while about 55% receive a "partial yes". Only between 10 and 15% of appraisals lie in the "no" category (George 2010).

For drugs that receive "partial yes" appraisals, "patient access schemes" are frequently offered where different prices may be paid for different uses, and may also be dependent on realized outcomes. In some cases, there are specific rebates that are offered for particular uses, while for others, the first product cycle is provided without charge or alternatively a cost equalization provision is established. Critically, for submissions that receive "no" appraisals, manufacturers are permitted to request a re-evaluation with different pricing, where resubmission is permitted after 3 months (Rawlins 2013; George 2010).

Although NICE considers the drug's price as fixed, the prevalence of patient access schemes is an indication that prices are not truly exogenous. There remains considerable price flexibility in their appraisal system. Established prices are critical because NICE's established benchmark is that drugs are considered cost-effective if their treatment cost is less than £20,000 per QALY gained but not cost effective if it exceeds £30,000. There is room for negotiation in the range between £20,000 and £30,000 per QALY.

More recently, however, NICE responded to political pressures and appeared to move beyond QALYs. It broadened its criteria by including "social values" in its decision process (Faden and Chalkidou 2011). These values would include subjective concerns such as those arising from life-threatening diseases. In particular, it had been reported that the UK stood in a politically unacceptable 8th place out of 14 developed countries in overall drug usage (Richards 2010; O'Neill and Sussex 2014; Nolte and Corbett 2014), and questions were raised as to whether NICE's advisories had been overly restrictive and led to that outcome.

In response, particularly to reports of limited access to expensive cancer drugs, the UK Ministry of Health proposed a "Pharmaceutical Price Regulation Scheme" that was designed specifically to move beyond cost per QALY analysis and take additional factors into account (Department of Health and the Association of the British Pharmaceutical Industry 2013, p. 23). Included among the additional factors to be considered was the "continuing supply of innovative treatments" to be

fostered by "continuous research and development and competitive efficiency" (p. 9).

For this purpose, the Ministry proposed to introduce "value based pricing" through a voluntary agreement between the Department of Health and the Association of the British Pharmaceutical Industry (ABPI). However, there was little consensus as to what this effort required, and in the end, no agreement was reached. As a result, except for Cancer drugs, NICE appraisals have remained unchanged and influential.

In contrast, for Cancer drugs NICE lost much of its influence. In response to patient demands, a Cancer Drug Fund was created to fund drugs that NICE had rejected. As might be expected, their prices increased with the removal of the cost-effectiveness restraint. However, this all occurred following the period covered by our data.

4 The United States Market-Based Pricing Structure

In the United States, there is no publically imposed pricing structure. The largest share of pharmaceutical purchases are not made by consumers directly but instead by insurance companies, health maintenance organizations (HMOs), government agencies and other payers. Prices are not fixed but instead are negotiated between these "third party payers,"—which are often represented by Pharmacy Benefit Managers (PBMs)—and the drug manufacturers. Furthermore, these negotiated prices can vary across transactions; and also they are not generally disclosed, except for those made by government buyers. These prices are set in a wholesale market where consumers do not participate. An essential feature of this market is that there are both informed buyers and sellers with regard to product attributes.

The buyers in this market seek to maximize health benefits for their subscribers at minimum costs. The buyers evaluate the health benefits of the drugs that are purchased for their subscribers in relation to the drugs' prices. Moreover, payers recognize that pharmaceuticals are generally less costly than providing in-patient hospital care, which is sometimes the alternative.

These buyers essentially engage in an implicit form of cost-effectiveness analysis when deciding how much they are willing to pay for a particular drug. While physicians may prescribe non-cost-effective drugs, payers can and often do react. Not only can they limit authorizations to particular conditions and specified patients, but also payers sometimes set higher co-pays for their use. Through both routes, payers can limit if not eliminate the use of non-cost-effective drugs.

To be sure, US payers face market pressures which can limit their actions. Physicians and patients impose restraints, which for private payers can take the form of shifting to more generous providers. Just as NICE was pressured in the case of cancer drugs to relax its strict application of cost-effectiveness criteria, so are payers in the United States restrained by their need to meet effective demands.

Where sellers exercise substantial market power and face relatively low marginal costs, they optimally respond to their buyers' demand conditions. In particular, they set higher prices where their buyers' willingness to pay is greater and lower prices

where it is lower. Through this process, value-based pricing outcomes generally prevail; and new product prices reflect the additional therapeutic value embodied in a new drug.

Available empirical evidence supports this account of new drug pricing in the United States (Reekie 1978; Lu and Comanor 1998). The extent to which launch prices exceed the prices charged for the drugs which had previously been used for the same conditions was directly tied to the extent of therapeutic advance. In effect, market incentives have led directly to value-based pricing.

Interestingly, similar findings were reported for Sweden, where prices are set through negotiation between drug manufactures and the government agency that is responsible for the country's drug benefit scheme (Ekelund and Persson 2003). That agency serves as the relevant payer, and prices largely reflect the drug's therapeutic advance. For both private and public payers, there exists the widespread use of value based pricing.

5 Comparing the US and UK Approaches to Cost Effectiveness

As noted above, pharmaceutical markets in the US and UK employ a variety of cost-effectiveness methods in determining demand conditions through which prices are set. An important question is whether these variants are sufficiently distinct that they lead to different price increments for the same therapeutic gains. Do regulatory or unfettered market processes lead to different evaluations of the therapeutic benefits from new drugs? Testing the hypothesis that similar price enhancements are established under these alternate regimes is the object of this paper.

To be sure, we do not deal in this study with the larger issue of what determines relative drug prices in the two countries. Answering that question turns on many factors, including currency exchange rates, which are not explored here. Instead our attention is limited to measuring the price increments that newly introduced drugs have over the older drugs that they replace.

Because drug manufacturers can be expected to exploit the therapeutic advantages of their new products, the relative cost effectiveness of a new pharmaceutical is reflected in the ratio of its launch price to the prices that are charged for existing therapies. Indeed, one can view the object of cost effectiveness analysis as assuring that any differences between launch prices of new drugs and current prices of the existing drugs used for the same purposes flow from the new product's therapeutic advantages. In the empirical analysis below, we test that proposition by comparing launch prices for the same drugs relative to those of the same previously used products in the two countries.

6 Data and Sample

We use IMS Health data on quarterly product sales and quantities for the same pharmaceuticals in the two countries. From these data, we derive average transaction prices during the first quarter of sales in each country. Because new

products may be launched at different times in the two countries, the relevant dates for the same product may be slightly different, although the lags here are typically short.

Our sample of drugs is limited to those approved by both the US FDA and the European Medicines Agency for use in the US and the UK, and also approved by NICE as cost effective in the UK. This sample is therefore limited to products with positive NICE approvals. Most appraisals reported the existing product or products with which the new one was compared, and we used those designations wherever possible. We also tabulated the average transaction prices for the alternate drugs in the same time periods.

NICE conducted upward of 180 appraisals between 2000 and 2008. However, most of them dealt with larger classes of drugs, medical devices, or new forms of therapy that were too broad for this investigation. In addition, there were some drugs for which we were unable to identify the existing products with which the new one could be compared. In the end, we were limited to 30 new pharmaceuticals evaluated by NICE, that were launched in both countries, and for which alternate drugs could be determined. These pharmaceuticals are listed in Table 1.

From the NICE appraisals and other sources, we determined the standard course of treatment for both the new and prior drugs, and then calculated the relevant prices for each. We then derived the price ratios between the new and prior drugs in both the US and UK. These ratios reflect the relative cost effectiveness of the new drug as compared with that of the prior drug therapy; the ratios are reported in Tables 2 and 3. Since these ratios are determined separately in each country, overall price effects are thereby removed.

As is apparent in Tables 2 and 3, the tabulated price ratios in each country for many products are not much different from one, so that relative prices are similar in the two countries. However, for some drugs, the tabulated price ratios are very large, which suggests major therapeutic gains. Because of the wide range in these ratios, we compare their logarithms.

The resulting frequency distributions of the logarithms of the tabulated ratios are given in Fig. 1. What is apparent is that the distributions for the US and the UK are not widely different.

7 Testing for Price Ratio Differences in the Two Countries

To test for equality between the US and UK price ratios, we employ two sets of statistical tests. The first is limited to the relative ranking of the ratios in the two countries, while the second concerns their relative magnitudes. Since we are interested in testing whether the British regulatory structure leads to different pricing outcomes than those found in the United States, both tests are relevant.

The results of the first test, which are limited to relative positions, are given in Table 4. The null hypothesis examined there is that with similar assessments in the two countries, we would find an equal number of ratios where each country is higher. To be more specific, from 30 paired observations, equal assessments would lead us to observe hypothetically 15 higher British ratios and 15 higher US ratios.

Table 1 Sample of NICE cost effectiveness drugs

Obs	New drug	Existing drug	Indication
1	ABATACEPT	METHOTREXATE	Rheumatoid arthritis
2	ADALIMUMAB	ETANERCEPT	Plaque psoriasis
3	ADEFOVIR DIPIVOXIL	LAMIVUDINE	Chronic hepatitis B
4	ANAKINRA	METHOTREXATE	Rheumatoid arthritis
5	BEVACIZUMAB	FLUOROURACIL	Colorectal cancer
6	EFALIZUMAB	INFLIXIMAB	Psoriasis
7	ENTECAVIR	LAMIVUDINE	Hepatitis B
8	ERLOTINIB	DOCETAXEL	Non small cell lung cancer
9	EZETIMIBE	SIMVASTATIN	Hypercholesterolemia
10	GALANTAMINE	DONEPEZIL	Alzheimer's disease
11	MEMANTINE	DONEPEZIL	Alzheimer's disease
12	ORLISTAT	SIBUTRAMINE	Obesity
13	OSELTAMIVIR	AMANTADINE	Flu
14	OXALIPLATIN	IRINOTECAN	Colorectal cancer
15	PEGINTERFERON ALFA-2A	RIBAVIRIN	Chronic hepatitis C
16	PEMETREXED	DOCETAXEL	Non small cell lung cancer
17	PIOGLITAZONE	METFORMIN	Type 2 diabetes
18	RIVASTIGMINE	DONEPEZIL	Alzheimer's disease
19	ROSIGLITAZONE	METFORMIN	Type 2 diabetes
20	TELBIVUDINE	LAMIVUDINE	Hepatitis B
21	TEMOZOLOMIDE	PROCARBAZINE	Brain cancer
22	TRASTUZUMAB	DOCETAXEL	Breast cancer
23	VARENICLINE	BUPROPION	Smoking cessation
24	ZANAMIVIR	AMANTADINE	Flu
25	PIMECROLIMUS	HYDROCORTISONE	Eczema
26	ETANERCEPT	METHOTREXATE	Juvenile idiopathic arthritis
27	INFLIXIMAB	BUDESONIDE	Crohn's disease
28	ATOMOXETINE	METHYLPHENIDATE	Attention deficit hyperactivity disorder
29	OMALIZUMAB (XOLAIR)	BUDESONIDE and FORMOTEROL	Severe persistent asthma
30	BORTEZOMIB	DEXAMETHASONE	Multiple myeloma

Instead, we find 19 higher UK ratios and 11 higher US ratios. While this difference is not statistically significant at conventional levels, note that (if anything) British prices relative to those set for the predecessor technology are more frequently *higher* than those in the US.

In our second approach, we estimate two regression equations in which the UK price ratio is regressed against the US ratios. As before, our null hypothesis is that

Table 2 United Kingdom prices and treatment costs

Obs	New drug UK treatment Cost $/year*	Existing drug UK treatment cost $/year*	Ratio new TC/existing TC
1	14,570.35	35.40	411.64
2	13,534.11	15,994.86	0.85
3	5275.97	4974.77	1.06
4	6856.13	28.93	236.97
5	72,467.23	86.78	835.05
6	8342.93	21,760.00	0.38
7	3950.45	5493.94	0.72
8	26,591.18	26,002.71	1.02
9	460.50	362.21	1.27
10	1021.90	997.15	1.02
11	1331.57	4384.78	0.30
12	0.74	0.58	1.28
13	19.01	3.81	4.99
14	9360.24	9045.27	1.03
15	9458.26	9743.59	0.97
16	34,953.05	25,196.67	1.39
17	684.68	48.05	14.25
18	1466.93	1009.54	1.45
19	362.37	48.72	7.44
20	5210.28	5623.59	0.93
21	17.13	0.32	53.86
22	29,333.86	8309.10	3.53
23	143.72	102.40	1.40
24	0.03	0.00	8.60
25	26.13	10.75	2.43
26	11,632.62	15.75	738.63
27	48,132.21	1286.07	37.43
28	2.51	0.48	5.24
29	18,336.48	353.72	51.84
30	40,946.43	124.05	330.08

*Converted from £ to $ at current market exchange rates

the two price ratios track each other so that the relevant regression coefficients should approach unity. In the first equation, the intercept is constrained to be zero so the regression line runs though the origin, while in the second, the intercept is unconstrained. The results are given in Table 5. As indicated there, although the slope coefficients in both models are statistically significant at conventional levels, neither is significantly different from one. In neither model can we reject the hypothesis that the US and UK price ratios are equal.

Table 3 United States prices and treatment costs

Obs	New drug US treatment cost $/year	Existing drug US treatment cost $/year	Ratio new TC/existing TC
1	17,937.81	28.86	621.63
2	14,224.99	17,025.00	0.84
3	5163.04	5491.23	0.94
4	11,505.69	34.52	333.32
5	116,108.50	254.88	455.54
6	9407.46	18,628.88	0.50
7	4828.52	6835.60	0.71
8	25,965.37	37,051.17	0.70
9	665.91	680.26	0.98
10	1254.49	818.01	1.53
11	1389.95	3733.02	0.37
12	1.15	0.77	1.49
13	35.98	1.05	34.12
14	31,184.60	29,685.67	1.05
15	13,039.51	14,011.83	0.93
16	58,542.06	36,728.22	1.59
17	1090.67	767.29	1.42
13	1398.76	795.86	1.76
19	511.37	738.13	0.69
20	5859.92	7767.02	0.75
21	17.35	0.47	37.04
22	30,888.45	8884.40	3.48
23	155.33	161.26	0.96
24	0.04	0.00	35.50
25	37.37	15.87	2.35
26	10,966.73	104.82	104.62
27	34,840.21	3184.30	10.94
28	1.93	0.58	3.30
29	21,898.68	674.08	32.49
30	33,703.81	1251.74	26.93

These price ratios are plotted for the unconstrained model in Fig. 2. As indicated there, the ratios lie relatively close to the regression line estimated here with a slightly positive intercept. From this vantage point as well, the price ratios in the two countries appear similar.

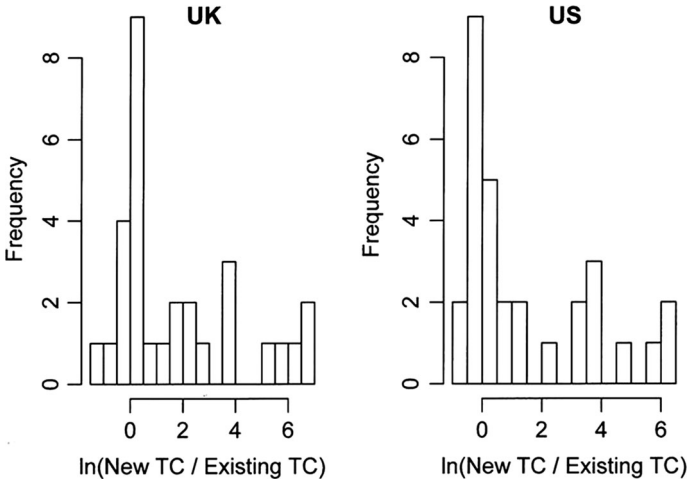

Fig. 1 Frequency distributions in the US and UK

Table 4 Testing relative price ratios in the two countries

Number of paired observations: 30
Number with higher UK ratios: 19
Number with higher US ratios: 11
Number with higher ratios under null hypothesis of equality: 15
Test statistic: $Z = \frac{19-15}{\sqrt{30/4}} = 1.46$
Follows a standard binomial distribution
Not statistically significant; $p = 20.05\%$

Table 5 Testing statistical equality of US and UK ratios

I. ln (UK ratio) = 1.052 ln (US ratio) (0.071)
$R^2 = 0.88$
$t = 0.73$ for null hypothesis that coefficient = 1.0; $p = 46.9\%$
II. ln (UK ratio) = 0.292 + 0.988 ln (US ratio) (0.0859)
$R^2 = 0.83$
$t = -0.1397$ for null hypothesis that coefficient 1.0; $p = 89.0\%$
Conclusions: from neither model can one reject the hypothesis that ln (UK ratio) = ln (US ratio)

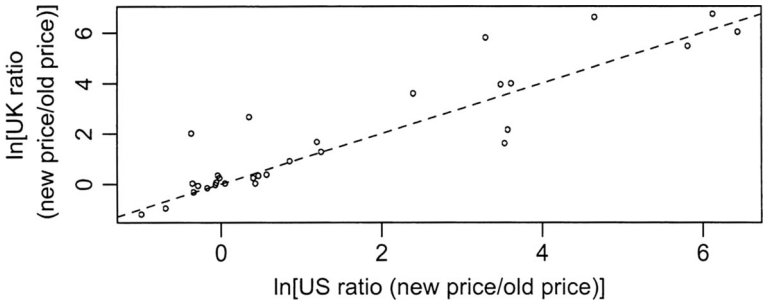

Fig. 2 Scatter diagram of UK and US price ratios

8 Conclusions

There is no indication in these data that the British regulatory structure leads to different relative prices from those found in the US. Value-based pricing is present in both countries, and there is no evidence that regulatory procedures lead to different outcomes than do market processes.

A critical feature of cost effectiveness analysis is that all pharmaceuticals are cost effective at some price. In that case, private firms that seek maximum profits will adjust their prices to accommodate either the regulatory or market environment in which they find themselves. Since both depend on the therapeutic effectiveness of a new pharmaceutical, there appear to be similar relative prices set in the two countries. Adding a formal cost effectiveness constraint, by creating an agency such as NICE, may therefore not alter greatly the structure of pharmaceutical pricing.

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