A comparison of the USA health care effort with other OECD countries *

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Recibido: abril, 2000
Aceptado: julio, 2002

Abstract
We use a sample of OECD countries in order to better understand why the US health care expenditure as a percentage of its Gross Domestic Product («health care effort») is so far above any other. To this end we employ a descriptive cross-country methodology based partially on econometric estimations, synthetic indicators and the Lerner's formula of market power, that allows us to dismiss as explanatory variables all those factors that were not differential across the sample. We advance the exploratory hypothesis that the availability of a universal public health coverage would increase the price elasticity of demand and thus would reduce the control of prices by the suppliers.

Keywords: US health care spending, cross-country health care comparisons, price discipline.


1. Introduction
One of the first things that usually strike a European after moving to the USA is the high cost associated to health care services, at least compared to those at countries whose levels of development are similar to the US according to most conventional measures. Far from being an unjustified observation, this comes out to be a well-known fact supported by the data: the US actually operates the most expensive health care system in the world, outstripping by over half again the health care expending of any other country (Iglehart, 1999) 1.

Against this background, it seems natural to wonder what factors would explain the higher US spending levels 2. The literature offers a number of possible explanations for this phenomenon, such as high administrative costs, overuse or unnecessary care, lack of effecti-

* We wish to thank J. Rovira for providing us the OECD Health Data 1998, and J. Costa, G. López-Casasnovas, J. Pons and three anonymous referees for their helpful suggestions and comments.
ve competition in insurance markets, intensity of services and technological change (new and better treatments), information asymmetry in medical care, the oligopoly position enjoyed by the providers through lobbying, etc. Nevertheless, one cannot fail to notice, at least from an European perspective, that many, if not all, of these explanatory elements also operate in other developed countries without resulting in health care costs comparable to those prevalent in the USA. The question therefore remains: why does the US spend so much of its Gross Domestic Product (GDP) in health care services?

Under these circumstances, it probably makes sense to produce a comparative study of the different levels of health care expenditure as a percentage of GDP («health care effort») across a set of economies sharing a comparable level of development in order to isolate those elements that are differential. Such is the purpose of this paper. In the next section we choose a sample OECD countries whose income per capita is above a 50 % of the USA, and we verify that, indeed, their aggregate income elasticity does not play a meaningful role as an explanatory factor of their differences in terms of health care effort. Consistently with the results of the standard literature, we find out that the sample singles out the US case as, by far, the one with the highest level of health care effort, whilst the rest are relatively homogeneous. We focus then (section 3) specifically on finding out what makes the US case so peculiar respective to the other developed countries in this data set. Then, in section 4 we introduce an exploratory hypothesis as an attempt to explain this findings and finally section 5 summarises the results.

It should be noted that the methodological approach of this paper is essentially descriptive and follows a strategy of elimination of hypothesis based on the evidence provided by econometric estimations, synthetic indicators and the Lerner's formula of market power.

2. A cross-country empirical analysis

To present the case of the USA in an appropriate perspective, we have chosen a set of OECD countries with a comparable level of economic development. In this context, table 1 clearly singles out the US as an outlier respective to the rest of the developed countries. The sample actually seems to comprise two groups of countries, one represented by the USA alone, with a level of health care effort of 14 % in 1997, and the other by the other 20, with an average health care effort of 8.1% (ranging from 7% to 10.4%). This can probably be better seen in terms of coefficients of variation for health effort. While the coefficient for the whole sample is 19.9% (year 1997), if we exclude the US from the sample this value goes down to only 13.3% (i.e., a difference of 32.8% over the total sample coefficient), thus suggesting that the other 20 countries are significantly closer to each other than to the US.

On the basis of this evidence, it now seems sensible to investigate the relationship between differences in health care effort and income per capita for our sample of countries. It is worth noting that there is a large body of literature in health economics analysing the determinants of the health care expenditures and in particular the relationship between spen-
Table 1
Total Health Care Expenditures as a Percentage of Gross Domestic Product.
Selected OECD Countries: 1960-1997

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Average (except USA) * 3.8 7.2 7.7 8.1

* Non weighted average
n/a: Not available
Source: OECD (1998)

ding and income per capita across countries. A common result of these studies is that income appears to be the most important factor explaining per capita health care spending variation between countries and that income elasticity is greater than one, although this finding is not sufficiently robust as pointed out by some researchers 6. According to Cutler (1995), for instance, just some, but not all of the higher US spending is attributable to higher incomes levels in the USA.

In order to verify that the different cross-country levels of economic development are indeed small enough not to explain their differences in terms of health care effort, we have performed a regression —slightly different to what is conventional in the literature— for the logarithm of the health care effort (variable: \( h_{gdp} \)) in 1997 against the logarithm of the income per capita (variable: \( pc_{gdp} \)) expressed in PPP —purchasing power parity— US$, year 1997. We have utilised White's heteroscedasticity consistent covariance matrix estimator, which makes it possible to conduct statistical inference on individual regression coefficients without knowing the actual form of heteroscedasticity. The results of the estimation are
\[
\ln(h_{gdp}) = -1.644 + 0.375 \cdot \ln(pc_{gdp})
\]
(White S.E) \quad (3.49) \quad (0.35)
(R^2 = 11.9\%; N = 21) \hfill [1]

White's corrected standard errors, expressed in parenthesis, are considerably larger than the conventionally computed values. Individually, the coefficients do not appear to be statistically different from zero by the usual \( t \) test. The results also indicate that only a 12\% of the variance in health care effort can be explained by the variation in the GDP per capita 7.

Actually, our finding is supported by other studies. For instance, the OECD (1987) report show that, after excluding the poorest countries from a sample of OECD countries (Greece, Portugal and Turkey), total health spending-GDP share and GDP per capita do not maintain a statistically significant relationship. In a similar way, if we take the database (table 1, p. 116) of the classical Newhouse (1977) paper—he finds an income elasticity exceeding unity—and perform a logarithmic regression between health care effort and income per capita, we obtain that after excluding Greece (with a 25\% of the USA GDP per capita in 1972) the income coefficient is again not significant at conventional levels. Parkin et al. (1987) also find a low statistical power of the relationship between the health care effort and per capita GDP, when the former is defined by PPP's units.

All this evidence thus seems to confirm, as Cutler (1995) suggested, the initial intuition that some structural difference exists between the US health care system and the one prevalent in the other developed countries above and beyond their different levels of income per capita. It seems then reasonable to try to break down the total health care expenditure into its components in order to identify where the source of this singularity could be.

In this context, the first question we should try to address is whether the difference in aggregate expenditure is due to a different volume of activity (quantity and intensity of health care services) consumed or simply different costs/prices. Although both quantity and intensity of services —this one related to the content of a given service— cannot be directly estimated, as they are composed of so many different elements, we can certainly use a set of indirect indicators as a proxy (see table 2). As far as quantities are concerned, in this table we observe that the number of doctors consultations per capita in the USA is actually low when compared to that of other countries in the sample (6 against an average of 6.85 for the other 20 countries). Even if we exclude the rather high value for Japan (15.8) the average remains higher than the US level, at 6.3. Another indirect indicator of demand of health services is the per capita use of in-patient care beds. Although the average utilisation per person differs among the rest of OECD countries, it can be observed that the US demand of in-patient care bed days per capita in 1996 is 1.1 days against an average of 2.50 days for the other 20 countries. Furthermore, the reported percentage of the population with an hospital admission was only 12.2 in the US, compared with a sample OECD average (excluding the United States) of 17.3 8.
A comparison of the USA health care effort with other OECD countries

Table 2

<table>
<thead>
<tr>
<th></th>
<th>Doctors consultations per capita *</th>
<th>In-patient care bed days per capita</th>
<th>Percent of popul. with hospital admission b</th>
<th>Magnetic Resonance Imaging per million pop. c</th>
<th>Scanners per million population d</th>
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<td>4.5</td>
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</table>

* Non weighted average

Data for Ireland and Italy are from 1988, the value for Spain is from 1989 and for Norway is from 1991. Data for Belgium, Canada and Switzerland are from 1993 and data for Germany and Japan are from 1995.

Data for Luxembourg and Switzerland are from 1994 and the value for Italy is from 1995.

Data for Australia, Belgium, Canada, Italy, The Netherlands, Sweden, UK and USA are from 1995. The value for Switzerland is from 1993.

Data for Austria, Japan, Netherlands, Sweden, Switzerland and UK are from 1993.

n/a: Not available


Even specific variables that have traditionally been pointed out as evidence of «over-treatment» in the US health system, such as the number of surgical procedures (not in table 2), do not seem to be so oversized when put in international perspective: the 11,011 surgical procedures per 100,000 population in the US (1995) do not seem many when compared with the 11,057 in the UK (1993), 13,268 in New Zealand (1996) or 15,862 in Australia (1995), and in fact other instances of far lower numbers (like Canada with 6,843 in 1994 or Switzerland with 7,570 in 1991) may be due to part of the procedures actually taking place in neighbouring countries (e.g., the USA for Canada or Germany and France for Switzerland).

There is ample evidence to suggest that intensity of health care activities, broadly —although not uniquely— related to the expansion of new medical technologies, is a key driver
of the US health care costs escalation in the last decades. For instance, Ashby and Lisk (1992) have found that apart from increased prices, intensity of services furnished (holding case complexity constant) accounted for 20% of hospital operating cost increases during the period 1985-1989. In a similar way, Newhouse (1992) —among other notable health econo­mists— attempting to quantify the possible causes of spending growth through the «residual approach» finds that «the march of science and the increased capabilities of medicine» ac­counts for much of the increase in health care expenditures \(^9\). Moreover, it is also true that the US has tended to adopt new medical advances more rapidly than other countries have, thereby incurring much of the incremental costs associated with medical innovation.

In spite of this evidence, it is far from obvious that technological change should be re­garded as a clear factor explaining the higher US spending levels when examined under an international perspective. Based on the limited evidence on the existing stock of technology across countries provided by the OECD (1998), it is evident from table 2 that, while the US enjoys higher capacity in some high technology facilities (for example, 16 magnetic resonan­ce imaging equipment and 26.9 scanners units per million population) than most other coun­tries \(^10\), in other instances of medical advances the US has lower capacity. Indeed, the US number of lithotriptors \(^11\) per million population in 1990 (not in table 2) does not seem high (1.5) when compared to Sweden (1.2), Germany (1.3 in 1991), Japan (2.5) or Italy (3.7 in 1991), nor does the US number of units of radiation treatment equipment per million population (3.8 in 1992) when compared to the values for Australia (3.8), Germany (4.6), Canada (4.6 year 1993), France (6.3) or Iceland (15.2).

Hence, if anything, we would tend to conclude, based on the scarce evidence presented by the available synthetic indicators, that American demand for medical services must not be the ultimate factor behind the differences in health care effort in our set of countries. In our view, therefore, the difference in expenditure must thus be basically attributed to cost/price.

Of course these costs/prices are only comparable if the levels of quality or health outcomes associated to these quantities or medical activities demanded are also similar. As far as quality is concerned, it should first be acknowledged that there is no single comprehensive metric to measure the level of quality that allows a fully satisfactory comparison across countries, and therefore the literature tends to use combinations of measurements capturing different, partial aspects of what we generally understand as «quality». Based on a wide va­riety of conventional quality or health status indicators, however, the literature suggests that in general the quality of health services either stands at a similar or even a lower level in the US respective to our set of comparable countries. Some indicators are particularly striking. For instance, the potential years of life lost indicator \(^12\) (table 3) for men in 1995 was of 8,401 years per 100,000 population in the USA, by far the highest in our sample (ranging from 7,342 in New Zealand to 3,928 in Iceland, with an average, excluding the US, of 5,867), and almost the same can be observed for women (4,591 for the USA vs. an average of 3,319 for the other 20 countries).

Similarly, the infant mortality in 1996 was of 7.8 per 1,000 live births in the USA against an average of 5.11 for the other 20 countries, while the perinatal mortality (1992) was of 8.5
Table 3

<table>
<thead>
<tr>
<th>Country</th>
<th>Potential Years of Life Lost (Years lost/100,000 males 0-69)</th>
<th>Potential Years of Life Lost (Years lost/100,000 females 0-69)</th>
<th>Infant mortality per 1,000 live births</th>
<th>Perinatal mortality per 1,000 births</th>
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<tr>
<td>Average (except US) *</td>
<td>5,867</td>
<td>3,319</td>
<td>5.1</td>
<td>7.2</td>
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</table>

* Non weighted average


per 1,000 births vs. an average of 7.22. Nor does the US immunisation rate (diphtheria, tetanus and polio, 1994) of 89.5% of the child population look high when compared with the 97% of Sweden (1995), the 95% of the UK (1995), the 92.8% of the Netherlands (1992) or the 90.2% of Spain (1995). Notwithstanding this, none of these indicators is strictly speaking a «pure» measure of quality, and therefore the discrepancies observed between countries could also be due to differences in lifestyle, education, accessibility to health care services, income inequalities, etc. Moreover, as a detriment of these indicators, the literature do not find a statistical relationship between health care spending and health status as measured by the above epidemiological ratios (cf. Hitiris and Posnett, 1992, Cutler, 1995, and Cutler et al., 1998). However, it may well produce improvements in so-called subjective components of health (Newhouse, 1977).

In fact, Quam (1988) reports that quality in the American health care system has steadily decreased throughout the 1980’s, as measured by several of these partial indicators 13, while the health care effort has simultaneously increased. All this suggests that, the quality (effectivity) of the health services provided in the USA would be either equal or, if anything, inferior to those in the other 20 countries in our sample, and therefore would not justify a higher unit
cost or price for those services. One would thus feel inclined to regard the health markets in
the 21 countries in our sample as similar in terms of both quantities and qualities of the servi-
ces demanded and, therefore, try to break down their costs/prices structures into their diffe-
rent components in order to determine what would account for their differences under other-
wise so similar conditions.

There are of course many ways to decompose costs or prices. However, for the purposes
of this paper it is probably useful to conceive the health care cost as composed of a market
price (composed by the premium paid by consumers and the price paid by insurers) plus an
«additional cost» due to the inefficiencies caused by the intervention of the government as a
health care provider. If these inefficiencies were relevant to explain differences in health care
effort, being both quantities and qualities comparable, we would expect the total health care
spending share of GDP to be higher for those economies in which a higher percentage of the
total health expenditure is financed by the public budget. Actually, Leu (1986) provides em-
pirical evidence suggesting that «the more governments are involved in providing or financ-
ing medical care in decentralised health care systems, the higher are health expenditures».

Our data seem in fact to contradict this hypothesis. Equation [2] shows the least squares
regression of the logarithm of the health care effort (variable: $h_{gdp}$) of these comparable
countries against the logarithm of the percentage of public expenditure over the total health
care expenditure (variable: $pu_{the}$) and equation [3] does the same but adding the logarithm
of income per capita (variable $pc_{gdp}$)

$$
\text{Ln}(h_{gdp}) = 5.82 - 0.860 \cdot \text{Ln}(pu_{the})
$$

(Std.Error) \hspace{1cm} (0.88) \hspace{1cm} (0.20) \hspace{1cm} [2]

$$(R^2 = 48\%, \text{ White Test } = 1.104, \text{ N } = 21)$$

$$
\text{Ln}(h_{gdp}) = 3.176 + 0.242 \cdot \text{Ln}(pc_{gdp}) - 0.807 \cdot \text{Ln}(pu_{the}) - 0.242
$$

(Std.Error) \hspace{1cm} (2.14) \hspace{1cm} (0.18) \hspace{1cm} (0.20) \hspace{1cm} [3]

$$(R^2 = 52.8\%, \text{ White Test } = 1.688, \text{ N } = 21)$$

We observe, based on our sample of developed countries, that the relationship between
health care effort and public share on total health care spending is negative (although the coef-
cient is comparatively lower in equation 3) and statistically significant at 99% of confi-
dence in both estimations, i.e., the larger the public share on the total spending, the lower the
health care effort. It is worth noting that income per capita is again not statistically signifi-
cant at the conventional levels. The low value of the White test indicates heteroscedasticity is
absent in both models.

The same finding is pointed out by the OECD (1987) report. In this case, based on a
sample of 20 countries (after excluding Greece, Luxembourg, Portugal and Turkey) and with
pooled data —years 1970, 1976 and 1982— health effort and the public share of total health
expenditures maintain (either through a linear or log regression) a negative, statistically sig-
nificant relationship at 99% of confidence ($R^2 = 42 \%$ and 47 \%, respectively). 14.
This finding is indirectly reinforced if we adopt a dynamic perspective. Table 1 shows that in each country there has been a period of rapid expansion in health spending as a share of total income in the 60’s and 70’s, followed (except in the United States) by stabilisation in the 80’s and 90’s, although both the timing of the growth and stabilisation and the levels at which stabilisation occurs are quite variable (cf. Evans, 1990). Certainly, while the US health care effort has dramatically increased by 5 percentage points since the 80’s, the other 20 countries have comparatively stabilised their ratios. At this point, the literature suggests that both public insurance and financing were the key public policies that permitted to establish health care cost controls («compression forces») and that these cost-containment mechanisms were not successfully applied in the US due to its fragmented reimbursement system.

Hence, what this evidence tends to support is the hypothesis that higher public penetration rates may be associated with better control over the health system costs. At first glance, this may seem surprising. If the cost/price of health care services were similar, why would people consume more of a good the higher the portion of it they had to pay from their own pockets? And if it were the cost/price what made the difference, why would it be higher in a more market-oriented, competitive system?

3. **Market price and the suppliers’ bargaining power**

Given that the market of health care services is characterised by non-perfectly competitive suppliers we have used the traditional Lerner’s formula of market power («\(L\)») to breakdown the market price,

\[
L = \frac{P - C'}{P} \leq \frac{H}{|\varepsilon_d|}
\]

where \(P\) represents the market price, the \(C'\) marginal cost, \(\varepsilon_d\) the price elasticity of demand and \(H\) stands for the Herfindahl market concentration index. Rearranging terms, this expression becomes:

\[
P = \frac{C'}{1 - \frac{H}{|\varepsilon_d|}}
\]

This leaves us with three main components of the market price: the marginal cost, the degree of market concentration and the price elasticity of demand.

The marginal cost essentially represents the pure technical cost of the services provided as such. Differences in the technical cost of each additional unit of service provided should therefore be explained by either the availability of cost-saving technology to provide the very same service or by economies of scale. However, since the access of the USA health care industry to modern cost-saving technologies is at least as good as that of any other OECD country, and the absolute size of the US (in fact the largest economy in the sample) as well as its population density (23 inhabitants per km², compared to 1.8 in Australia, 2.3 in
Canada or 11 in New Zealand) seem to indicate that the US access to economies of scale would be at least as high as that of any of the other countries in the sample, we would tend to conclude that a higher marginal cost cannot be the cause of the market price differential between the USA and the other 20 economies in our database.

Regarding the Herfindahl index of market concentration, it is certainly different for every single component of the supply, i.e., it would be different for the concentration of the physicians services, the hospital services, the pharmaceutical products, etc., and even within each one of these broad categories would there be a number of subdivisions to which a different H might need to be associated. Besides, although some empirical estimations of this variable for specific sections of this market are available, they typically do not cover all the possible components of the expenditure, and their international comparability is often questionable. Nonetheless, as the purpose of our work is just to grasp whether the significant difference in the USA market prices we have identified respective to those prevalent in comparable OECD economies can be attributed to an equally higher Herfindahl index across the most relevant components of the health care expenditure in America, for these very limited purposes an indirect method would probably be sufficient.

The method we will propose is based on the fact that the physician services constitute, if not necessarily the heaviest component of the total expenditure (the average OECD value is 15.2 % against 42.6 % for in-patient services in 1997), certainly a key component of most of the health service packages consumed. The physicians market is characterised by the fact that the ability of each physician to produce output (in terms of working hours) is limited to a maximum of a given number of hours a day and therefore, when compared with other physicians within the same speciality and level of professional skill/prestige in a given local market, their individual market quotas should be close to equal. This means that, in terms of the definition of the Herfindahl concentration index (see footnote 16), the market share variance across every such set of comparable physicians would be close to zero and, therefore, the Herfindahl index would be a direct consequence of the density of physician services supply within that local market and area of specialisation, and this ratio of physicians per inhabitant is, at an aggregate level, usually available and comparable across developed nations. In this sense, the OECD (1998) data (table 4) clearly show that the number of practising physicians per 1,000 population in the USA stands just within our sample average (2.6 vs an average of 2.8, ranging from 1.6 in the UK to 5.3 in Italy), thus suggesting that, in the case of physician services strictly considered, the index of concentration would probably not explain the difference between the USA and the other countries.

Now, under these conditions, and remembering that physicians services are generally wrapped together with other components to constitute the service package the final consumer demands, if the concentration index (i.e., ultimately, the bargaining power) of the suppliers of the other components were higher in the USA than in the other countries of the sample, they would be able to earn a larger share of the price of the total health service package, and that different share would be reflected at an aggregate level. But it is not. Although data on average physician income are not available for all countries at all times, we could obtain information for 14 of the 21 countries in our sample (from 1990 to 1996), suggesting that the
A comparison of the USA health care effort with other OECD countries

Table 4

<table>
<thead>
<tr>
<th>In patient care beds per 1,000 population</th>
<th>In patient care occupation rate (% of available beds) a</th>
<th>Total health employment per 1,000 population b</th>
<th>Practicing physicians per 1,000 population c</th>
<th>Social protection - total medical care coverage (as a % of total population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>8.7</td>
<td>85.6</td>
<td>31.6</td>
<td>2.4</td>
</tr>
<tr>
<td>Austria</td>
<td>9.2</td>
<td>80.3</td>
<td>n/a</td>
<td>2.6</td>
</tr>
<tr>
<td>Belgium</td>
<td>7.2</td>
<td>83.5</td>
<td>21.1</td>
<td>3.4</td>
</tr>
<tr>
<td>Canada</td>
<td>5.1</td>
<td>84.2</td>
<td>25.2</td>
<td>2.2</td>
</tr>
<tr>
<td>Denmark</td>
<td>4.9</td>
<td>84.8</td>
<td>21.1</td>
<td>2.9</td>
</tr>
<tr>
<td>Finland</td>
<td>9.2</td>
<td>84.9</td>
<td>35.5</td>
<td>2.7</td>
</tr>
<tr>
<td>France</td>
<td>8.7</td>
<td>80.5</td>
<td>26.2</td>
<td>2.8</td>
</tr>
<tr>
<td>Germany</td>
<td>9.6</td>
<td>84.0</td>
<td>27.9</td>
<td>3.3</td>
</tr>
<tr>
<td>Iceland</td>
<td>14.8</td>
<td>n/a</td>
<td>32.4</td>
<td>3.0</td>
</tr>
<tr>
<td>Ireland</td>
<td>3.7</td>
<td>84.3</td>
<td>17.3</td>
<td>2.0</td>
</tr>
<tr>
<td>Italy</td>
<td>6.0</td>
<td>72.5</td>
<td>18.0</td>
<td>5.3</td>
</tr>
<tr>
<td>Japan</td>
<td>16.2</td>
<td>82.5</td>
<td>19.1</td>
<td>1.8</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>10.7</td>
<td>73.4</td>
<td>18.1</td>
<td>2.2</td>
</tr>
<tr>
<td>Netherlands</td>
<td>11.2</td>
<td>88.6</td>
<td>23.4</td>
<td>2.6</td>
</tr>
<tr>
<td>New Zealand</td>
<td>6.8</td>
<td>n/a</td>
<td>17.2</td>
<td>2.0</td>
</tr>
<tr>
<td>Norway</td>
<td>15.0</td>
<td>83.8</td>
<td>70.1</td>
<td>2.7</td>
</tr>
<tr>
<td>Spain</td>
<td>4.0</td>
<td>77.6</td>
<td>11.9</td>
<td>4.1</td>
</tr>
<tr>
<td>Sweden</td>
<td>5.6</td>
<td>83.0</td>
<td>43.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Switzerland</td>
<td>n/a</td>
<td>82.6</td>
<td>n/a</td>
<td>3.1</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>4.5</td>
<td>n/a</td>
<td>19.8</td>
<td>1.6</td>
</tr>
<tr>
<td>United States</td>
<td>4.0</td>
<td>67.6</td>
<td>32.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Average (except USA) *</td>
<td>8.5</td>
<td>82.1</td>
<td>26.6</td>
<td>2.8</td>
</tr>
</tbody>
</table>

* Non weighted Average

a The value for Switzerland is from 1991.
b Data for Luxembourg and New Zealand are from 1991 and for Belgium, Italy and Spain are from 1992.
c The value for The Netherlands is from 1991.
n/a: Not available


percentage of physician earnings over the total health care expenditure in the USA (13.3 % in 1996) is in fact higher than the sample average (10.2 %, ranging from 17.7 % in Germany to 6.1% in Japan). If the bargaining power obtained by, say, the hospitals through their concentration rate were significantly higher than in any other OECD country, we would expect, according to this reasoning, the share of the physicians to be significantly lower, rather than slightly higher, than in the other economies.

This implication is somehow reinforced by more direct evidence. For instance, Bamezai et al. (1999) found the US Herfindahl index for health care centres to be around 0.38, i.e., not necessarily a very high one compared with other economic sectors (it would be intuitively equivalent to having three roughly similar hospitals available in the same area for all the services demanded), whereas in many European countries the situation is often one of qua-
si-monopoly (Bohigas, 1997). This would be consistent with the fact that the US in-patient care bed days occupation rate (table 4) is in fact remarkably low when compared to other countries, actually the lowest value in the sample (67.6% vs. an average of 82.1% for the other 20 countries—the next lowest value actually corresponding to Italy with 72.5%): the available supply of in-patient care beds thus seems to be far higher in the US respective to the other countries, which, other things being equal, would result in pressures towards price reduction due to excessive supply, rather than the opposite.

4. **An exploratory hypothesis**

We are thus left with the price elasticity of demand as a possible explanation for these market price differences. However, we have already seen that these 21 countries demand a similar quantity and quality of health care services per capita despite the different prices they have to pay from one country to another. Hence, if the total demand is not less price sensitive in the USA than in any other of the countries in the sample, the question reduces to find out whether the portion of demand the private suppliers face is price-elastic or not. And this could certainly be the case if private health care had to compete with public health care as a close substitutive.

It has actually been empirically verified (e.g., Besley et al. 1998 and 1999, working with UK data) that consumers regard public and private health care as close substitutives and, therefore, resort to one or the other depending on the balance between the waiting time in line on one side and the need to pay for a private insurance on the other. Based on this, we should expect the demand for private health insurance to be more elastic the more widely available an alternative public service is. And indeed, the percentage of coverage of the population by the public health care system constitutes a fundamental difference between the USA and the other 20 countries in the sample. As we can observe in the last column of table 4, the degree of coverage is very high in all the countries of the sample (reaching 100% in most of them, with an average, excluding the US and the Netherlands, of 99.5%), whereas in the USA the coverage by public programmes only reaches a 45% of the population. This implies that in all those countries the consumer can always choose between waiting in line for a public health care service whose direct, perceived price is low or free apart from the waiting time itself (as the cost of the service itself is paid for indirectly through a combination of general and payroll taxes) or paying for a faster service at a private facility.

In other words, the public health coverage would be playing the role of a close substitutive product respective to private insurance, which means that, other things being equal, its presence would increase the price elasticity of the demand facing the private supply. Yet in the USA a whole 55% of the population is not covered by public programmes, i.e., has no other choice but to resort to the private system, and therefore the demand of private health care services of at least these individuals would remain as inelastic as ever, thus, per Lerner’s formula, increasing the degree of control of the market prices exercised by the suppliers. Thus, rather than an element of market inefficiency, as some other government-provided ser-
services may be, the universal public health care coverage would impose a price «threshold» (namely, the price for which the cost of waiting in line would equal that of private health care) on a market whose prices, as the basic elasticity of demand is so low, have a very high potential for virtually unlimited escalation.

It is worth noting that the relationship between the level of health care effort and the degree of health coverage has already been analysed, for instance, in Evans (1990). Indeed, when comparing the evolution of health care effort between the US and Canada since the World War II, Evans argues that differences (14.1% in the US and 9% in Canada in 1997) began in 1971 in the subsectors of hospital and medical spending (precisely those covered by the Canadian public plans) when health coverage became universal across Canada. Since then the Canadian ratio drifted steadily down through the OECD pack.

This hypothesis lends itself fairly well to a purely neo-classical analysis using Marshallian demand curves (figure 1). Let’s consider a monopolistic market with a very inelastic demand (as it usually is the case in the health services market, at least in developed countries). The monopolistic supplier would set the supplied quantity at \( Q \) (instead of \( Q^* \), which would be the case under perfect competition) so that the market price rises up to \( P \) (well above the perfect competition price set at \( P^* \)). Let’s imagine now that there is a government offering health coverage, either at a subsidised price or just for free (in which case the price would just be the cost of waiting in line), while allowing the individuals covered the freedom to consume from the government-financed or the private health services.

In order to supply these services, the government of course has to buy them from the health market itself, so in principle, if all the health services consumed by the individuals un-

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**Figure 1. The effects of a public provider ensuring universal coverage on total demand**
der public health coverage are consumed from the public supply, the market remains exactly the same. However, these individuals now have the choice between two goods that, if not necessarily perfect equivalents (as there could be issues with the quality, the accessibility or the waiting time of the government-supplied services, for instance), can be regarded as close substitutives. Hence, in addition to their demand from the government, they will also demand services directly from the private supplier but, since they have a close substitutive available, this additional demand will be more elastic that that of the non-covered individuals (the more elastic the better the government-supplied services perform as a close substitutive of the private ones). As we see in the figure, thus, even if the net result is a net increase in the total demand for health services, the increment in the elasticity of the total demand will force the monopolistic supplier to reduce the price from $P$ to $P'$ which, if the difference in elasticity is significant enough, can result in a net saving in terms of total health expenditure, even despite the increment in the quantity demanded from $Q$ to $Q'$.

Actually, the idea that the presence of a public health care network imposes price discipline in an otherwise highly-priced, oligopolistic market is not fully new in the most recent literature. For instance, Jofre-Bonet (1998) develops a vertical product differentiation model with unequal incomes according to which provision of health care services by a mixed oligopoly (public and private providers) instead of a strictly private oligopolistic setting, results in a decrease in the private price and output and an improvement of the level of quality privately supplied. Therefore, public health expenditure would crowd out private health spending but, at the same time, total health care expenditure would increase as part of the population unable to afford health goods and services under the private oligopolistic market spends a positive amount when those services are provided through a mixed oligopoly.

In this model, in fact, if the provision of the public health service does not increase much the total quantity consumed (as one would expect to find in a developed country), the total health care effort can actually become lower. However, this takes place due to the assumption that the public supply is produced independently from the private one, so that its cost does not include the extraordinary profit of the oligopolistic vendors (not even that of the physicians or the pharmaceutical industry, for example) that increases the market price of the privately-supplied health care services, and would therefore be unable to explain why, in our empirical research, the public health coverage seems to make a difference regardless of whether it is provided through directly public institutions or through public financing of the consumer consuming private or semi-private health care services.

5. Conclusions

The main purpose of this paper, based on the health database provided by the OECD, was to analyse a sample of 21 countries at a comparable stage of economic development in order to better understand why the US health care expenditure as a percentage of GDP is so far above any other. To this end we employed a descriptive cross-country methodology based partially on econometric estimations, single indicators and the Lerner's formula of mar-
ket power. This approach allowed us to dismiss as explanatory variables a number of factors that were not differential across the sample, such as levels of income, quantity and intensity of services, technology, the public share of total health care expenditure, concentration of the supply, etc.

We advanced the tentative hypothesis, although supported by indirect evidence no formal proof has been developed and this may restrict the strength of the conclusions, that the price-elasticity of the demand for private health care services would be higher in those countries where universal public health coverage would be available, as the public supply would be regarded by the consumers as an alternative source of a close substitutive to be paid for through a waiting list instead of direct fees, which would set a «threshold» price above which they would turn from private to public supply.

In other words, the public alternative would increase the price elasticity of demand and thus reduce the control of prices by the suppliers. Under these conditions, the USA, as the only country in the sample with a low rate of public health care coverage (only 45%) would not enjoy the advantages of such a mechanism of price discipline and, per Lerner's formula, would be exposed to a higher degree of market control by the suppliers.

Notes

1. In 1998 Americans spent about $4,270 per person on health care, as compared with the next most expensive country, Switzerland, which spent some $2,740 (OECD Health Data 1999).

2. Certainly, another interesting question is to investigate whether Americans get more (in terms of better health outcomes) from their health care system given the larger share of wealth they spend on health. See, for instance, Cutler (1995), Cutler and Richardson (1998) and Anderson et al. (2000) and the references there cited.


4. Conventionally, we will take as «developed» the 21 countries whose income per capita (in PPP —purchasing power parity— US$, year 1997) is above a 50% of that of the USA. The sample of countries is then composed by: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, United Kingdom and United States. Source: OECD (1998).


6. See, for example, cross-sectional studies such as Newhouse (1977), Leu (1986) and Parkin et al. (1987); pooled-data studies such as Hitiris and Posnett (1992), Moore et al. (1992) and Gertham and Jönsson (1995); and time-series analysis such as Marillo et al. (1993). Cf. Kanavos and Mossialos (1999) for a comparison of these investigations.

7. It is worth noting that when Luxembourg is dropped from the sample, heteroscedasticity disappears and income per capita accounts for a only 32% of the health care effort variation, being statistically significant at 95% of confidence.

8. However, as noted by Anderson et al. (2000) who also use these indicators as a proxy for quantities, «the US figure excludes outpatient (day) surgery activity, which is likely to have been included as in-patient activity in some other countries».
9. In a survey of 50 leading health economists in 1995, 81% agreed with the following statement: «The primary reason for the increase in the health sector's share of GDP over the past 30 years is technological change in medicine» (Fuchs, 1996).

10. In fact, Japan has more MRIs, scanners and also computerised tomography scanners per capita than the US has, but the Japanese health care effort is much more lower (7.3 vs. 14 % in the US).

11. Radiation equipment for non-invasive treatment of renal or biliary calculi by explosion.

12. The Potential Years of Life Lost (PYLL) is a summary measure of premature mortality which provides an explicit way of weighting death occurring at younger ages, which are, a priori, preventable (cf. OECD, 1998).

13. The «National Roundtable on Health Care Quality 1998 report» concluded that serious and widespread quality problems exist throughout American medicine. An important movement to improve the quality of health care has sprung up in the US, as a reaction to reduce costs associated to overuse and misuse of health services (Bodenheimer, 1999).

14. Notwithstanding this result, when an interaction variable between income per capita and public expenditure share is added in equation [3] and, what is more relevant in our case, the sample is increased until 29 OECD countries (i.e. 8 relatively poorer countries are included) we find, apart that all variables are statistically significant, a positive (negative) relationship between health care effort and public spending share for countries with a low (high) income per capita. However, these results are not statistically significant when the regression is performed based on our shorter sample of countries.

15. According to Evans (1990) this evidence shows that «the argument that the share of health care costs in national income must rise with incomes is decisively refuted».

16. The Herfindahl index is defined as the sum of the squares of the market shares $s_i$ of the different suppliers $i = 1 \ldots n$, that is, $H = \sum_{i=1}^{n} s_i^2$. A bit of algebra allows to transform this expression into $H = \frac{1}{n} \cdot \sigma^2$, where $n$ represents the number of suppliers and $\sigma^2$ stands for the market share variance.

17. See for example Bamezai et al. (1999) for the hospital market structure in the USA.

18. We can not ignore another important element, administrative costs, that have been cited as a key determinant of the huge US health care spending. Some studies indicate that administrative costs accounted for up to 24 % of total US health spending in 1992, much higher than those registered by countries with universal health care systems. In any case, under an international perspective and taking Canada as a reference, higher administrative expenses would explain just 13 % of the gap in health care effort between these two countries. Cf. Thorpe (1992) for a critique in making comparisons among health systems based on ratios of administrative to total spending.

19. This would confirm that the total demand for health care services is very price-inelastic for all these developed countries.

20. The OECD (1998) health data series assigns a 72 % coverage to the Netherlands, but this is due to the complexity of the Dutch system, which results in this figure not being comparable to other countries. More specifically, according to the «Sources & Methods» section of the OECD data set, «The population coverage ratios are weighted averages of share of the population covered by the health insurance funds (public) and the whole population covered by AWBZ. The weights are the shares in total costs of the costs covered by health insurance funds and AWBZ For the social protection ratio, the share of public finance (government, social security payments and AWBZ) in the total expenditures are presented», which results in the coverage ratio being very similar to the actual percentage of public vs. private health expenditure.

21. This actually ties back to the in-patient beds occupancy rate in table 4 for, as we know from the theory of queues, there is a direct relationship between the waiting time and the occupancy rate of a server. In those countries where the widespread public health coverage allows the queue, behind a public health care provider, to act as the alternative to the payment to a private supplier, the queue will be as long as to equate the cost of waiting with that of paying for the private service and, thus, the average occupancy rate will be consistently high, whereas in a strictly private system (unless the market concentration rate is very high, which, as we have seen, does not seem to be the case in the USA) such an alternative would not exist and hence the average queue (and with it
A comparison of the USA health care effort with other OECD countries

the average utilisation rate) would, other things being equal, be consistently lower. In other words, the total utili-
sation rate in countries with 100 % public coverage would appear artificially high, when compared with a fully
private system, as a consequence of the role the waiting time plays as a mechanism of price discipline.

22. To some extent this neo-classical approach could be reinforced by an institutional analysis. Abel-Smith (1988)
provides historical evidence suggesting how powerful American medical associations, in one way or another,
 SUCCESSFULLY frustrated every intent to extent the compulsory health insurance in the US and eliminated vir-
tually all form of price controls just to remove price competition among health insurance companies or doc-
tors. Against this view based on the opposition of special interest groups, see Fuchs (1996).

23. Jofre-Bonet (1998) assumes that the public provider maximises the population's net consumer surplus subject
to three constraints: a) universal coverage, b) the satisfaction of a public budget constraint given a public trans-
fer from the government and c) the private provider is not driven out of the market. Whereas, the private provi-
der maximises profits.

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**Resumen**

Se emplea una muestra de países de la OCDE para comprender por qué el gasto sanitario de los EE.UU. en porcentaje de su Producto Interior Bruto («esfuerzo sanitario») es mucho más elevado que en cualquier otro país. Para ello se desarrolla una metodología descriptiva basada parcialmente en estimaciones econométricas, indicadores sintéticos y la fórmula de Lerner de poder de mercado, que nos permite descartar aquellas variables que no son diferenciales en la muestra. Se avanza una hipótesis exploratoria en la que la existencia de una cobertura pública universal tendería a elevar la elasticidad precio de la demanda y a reducir el control de precios de los oferentes.

**Palabras clave:** gasto sanitario en los EE.UU., comparaciones internacionales de gastos sanitarios, disciplina de precios.

**Clasificación JEL:** H51, I18.