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The Growth of Health Expenditure in France

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ABSTRACT : To explain the growth of health spending in France over a long period, we proceed first to an overview of the factors of supply and in particular the medical technical progress. This contributes to increased health care costs. In a second step, we estimate a function of health expenditures on time series in France between 1975 and 2010. Health expenditures appear to be very sensitive to changes in the standard of living by GDP per capita would explain almost two-fifths of their progress. The price elasticity of health expenditure in France is also quite high even when taking into account the management of these expenses by the social protection system.

KEYWORDS: Health Expenditure Growth, Technical Progress, the standard of living, GNP.

I. DETERMINANTS OF HEALTH EXPENDITURE: AN OVERVIEW OF EMPIRICAL STUDIES

1.1 Factors of Demand

Following the work of Newhouse (1977), there is a wide range of assessments income elasticity of demand for health (McGuire, 1986; Murillo et al, 1993). In most macroeconomic studies available, they use time-series and cross-sectional data international elasticity of health expenditure per capita standard of living is higher than unity. The coefficient is sensitive to the chosen specification and definition of variables. First, the income elasticity is always high and close to unity. Secondly, the standard of living is by far the most important explanatory variable, relative to other demand variables (including aging) and prices. In a recent study based on cross-sectional data and time combined for 20 OECD countries (OECD, 1995), the income elasticity of health expenditure is less than unity (0.7) after addition of national and temporal dummies (fixed effects model with two factors). In this study, increases in income do not explain less than 50% of the total increase in health spending since 1960.Aging, usually estimated by the increase in the share of more than 65 years in the general population, directly affects health spending since the elderly consume about four times more health care than others (OECD , 1995). More precisely, we know that about one fifth of health expenditure is spent on patients in their last year of

The mechanisms of action of aging are complex, resulting from a lengthening of life expectancy and other phenomena of generation (cohort effects). These result from the arrival at older ages people who have experienced a well developed insurance (since the postwar period in the case of France) unlike previous generations. It is therefore cohort who acquired habits of consumption of high care. However, this effect, if it could play in recent years, should gradually subside due to the homogenization of cohorts in access to care. Longer life expectancy could, according to a study on U.S. data (Scitovsky, 1988 cited in Abel-Smith, 1995), also help reduce the impact of aging: people with higher age (than 80 years) consume health care cheaper in their last year of life than the younger age group (65-79 years).

In total, either from retrospective analyzes (OECD, 1995) or prospective impact of aging is limited and does not explain the increase in health spending. Thus, in the case of France, Hourriez (1993) explains 3% increase in health spending between 1970 and 1990 the contribution of aging, nearly a tenth of the increase. In addition, a factor common to all developed countries, albeit with different, it may help to explain the differences between countries trend.Measuring the impact of health care costs is a source of many difficulties for health economists. Besides the difficult distinction between income effects (ability to pay) and price effects (willingness to pay), it is important to define the price considered (McGuire, Henderson and Mooney, 1988). Indeed, the medical expense is generally covered by insurance and patients do not face the real costs of health care. More than price effects, economists then measure at the individual level, the impact of the extent of, since coverage for consumers, an extension of coverage equivalent to a reduction in the price of medical care.

1.2 Factors offer

Regressions carried out by the OECD (1995) to explain health expenditure from the usual factors of demand reveal a residue important in the order of 50% for an income elasticity equal to 0.7. This led the OECD to emphasize the role of supply factors. However, when we examine the conditions of the offer, without doute convient he carefully distinguished between static and dynamic aspects: it is indubitable that misallocation of supply may lead to excessive health care costs the idea that the supply is responsible for the continuous growth of health care costs is more difficult to substantiate. In this respect, the phenomena of "supply-induced demand" and technical progress are two "plausible candidates."Induction of demand supply could actually contribute to rising health care costs, and more so than many OECD countries are exposed to problems of excess supply of care (for practitioners and hospital beds in particular), but empirical validation of this hypothesis is not satisfactory (Rochaix, Jacobzone, 1997).

The relationship between doctor and patient can be likened to an agency relationship, the patient is enasymétrie information and authorizes the physician's decision-making power, the latter being better ninformé on the nature of the disease and care most appropriate. If the doctor is in the sole interest of the patient, the demand for care is no different from a traditional demand a sovereign consumer, the physician may use its information advantage to expand its business beyond what is required by the state of health of the patient. This will be especially true in a system of fee, where doctors can react to changes in their environment by adjusting their workload in order to achieve their income goals (Evans, 1974). Thus, when the medical density increases, as was observed for three decades, physicians can encourage patients to consume more care. For Gerdtham et al (1992), for example, working on cross-sectional data in 1987, a system of fee increases health spending by 11%. However, studies on individual data particular cannot decide on the actual role of health care provision.

Finally, more generally, new medical techniques or increasing physician density can artificially stimulate demand, to the extent that the healthcare providers have a captive market. It remains, however, that technical progress or a higher density of physicians come to reveal latent demand that only wanted to express themselves, as can be seen in many sectors.Medical technical progress does not generally lead to lower costs, but their growth by improving the quality of care It is possible to apply to the health argument traditionally used to explain part of the growth in spending and services in total employment, that a slower technological progress in this sector. This is the phenomenon of unbalanced growth (Baumol, 1967): Assume that whatever their income level, the agents consume goods and services from one other in a constant volume.In this case, technical progress slower in the services sector will mean that more jobs will be affected. Under the assumption of homogeneity of wages between sectors, the number of jobs will be associated with greater spending more total service value. Correspondingly, the relative unit cost of these services should rise by unit cost of goods (which are produced with a decreasing number of working hours). This model actually applies well to the overall growth of services in developed countries. From there, it is tempting to apply directly to the case of social spending in general and disease-specific expenditure.

To explain the game of modern technical progress, several authors have used the scheme proposed by the biologist Lewis Thomas (1975). It distinguishes three phases of the same disease. In a first phase, the disease, little known and poorly understood, is inexpensive. In a second phase, a new technology, called intermediate, used to treat the disease or limit the effects of the price of high costs (anticancer treatments and, more recently, organ transplants). In terms of the typology proposed above, it is medical technical progress under the second category. In a third phase, the innovation can drastically reduce the cost of treatment, the most emblematic case is that of the polio vaccine, inexpensive to administer and has virtually eliminated the disease.
More fundamentally, Feldstein (1977) and Weisbrod (1991) have clearly highlighted the interactions between technological, health insurance and improvement of living standards. If technical progress has the primary effect of reducing unit costs of production, and if the price elasticity of demand is less than 1 (as suggested by empirical studies), the total cost of care tend to decrease, all other things equal.If, however, technical progress has the primary effect of improving the quality of care, cost of care may increase, even if the price elasticity of demand is less than unity. However, public funding distorts the incentive to develop efficient technologies, and instead favors the emergence of high-quality technical, but expensive.
The introduction of new medical devices and new drugs ultimately arises the problem of evaluation and training of care providers.

II. EXPLAIN THE GROWTH OF HEALTH SPENDING IN FRANCE: AN EMPIRICAL STUDY

The purpose of this second part is to estimate a function of macroeconomic health expenditure time series in France using the database eco-OECD Health which includes annual data covering the period 1975-2010. The use of time series is an original in a field where the estimation techniques used are based primarily on cross-sections. Moreover, by limiting the French case, we will consider a set of variables larger than those taken into account in comparative studies on time series which are generally limited to the sole influence of living and relative prices (Murillo et al, 1993). The database annual OECD makes it possible to construct a number of indicators for the determinants of health expenditures. Five types of determinants have been explored: the level of life, demographic, institutional context, the relative price of health and medical technical progress. For the latter, the series available to build the different indicators are generally available only since 1985.

The dependent variable is the level of health spending per capita volume. It performs an univariate estimation in two stages, the Engel and Granger (1987). There is indeed too little data to make annual estimates multivariate satisfactory. It is therefore, in a first time, to estimate a relationship level using OLS and verify the cointegration by testing for stationarity of the residuals of the long-term relationship (Dickey -Fuller). The residues are then introduced into a growth model to specify the short-term dynamics of the model error correction. This estimation strategy is of little originality, and we do not elaborate further. We first present the indicators used before to describe the model as a whole.

The standard of living is measured by the volume of gross domestic product per capita (the deflator is the GDP deflator). In all estimates we could make it spontaneously appears very significantly and accounted for most of the evolution of health expenditure (between half and two-thirds according to the specifications and the estimation period used). However, the value of the elasticity of health expenditure and standard of living measured depends on the presence or absence of a linear trend regressors in health spending. With or without linear trend, the élasticitéest than unity when the estimation is performed since 1985. It is the same model without a trend when the estimate begins after 1980. In contrast, a model with estimated trend after 1980 shows a systematic elasticity less than unity. Over the past 25 years, in practice it is difficult to discriminate between a model incorporating an autonomous tendency of increase in health spending and income elasticity less than unity and a model without autonomous trend where the elasticity is greater than the unit. In models without trend, the income elasticity has an average value 1.25, which corresponds to the result as get Murillo et al (1993) in the case of France. The relative price is the ratio of the price index of health spending than private final consumption of households, possible substitutions between health expenditures and other expenditures not putting at stake all the components of GDP. Contrary to what is observed in all other OECD countries, the relative price of health spending as measured decreases in France since the early seventies, in particular due to the control of medical fees and the price of the drug. This price reduction relatifdevrait a priori strengthen health spending growth through two channels: it stimulates the consumption of outpatient care, which is covered at 60% by the public, it does not encourage providers care to control volumes (including those FFS). This effect was confirmed in the estimation, where the relative price has become very significant and with the correct sign (negative).

The institutional framework determines the conditions of access to care through the support of health expenditure by social security bodies. Two indicators were tested. The first is coverage by social security: the share of the population with access to social security schemes. The second is a support rate: the share of medical bills funded by government. These two indicators have increased since the early sixties, and tended to "cap" in the eighties. The coverage, which increases by successive steps, reached a maximum of 99.5%, according to the intention to establish a system of universal health insurance. Rate management, whose evolution is progressive, is around 75%, with a downward trend in the most recent years. Only the latter was significant. Thus, the extension of coverage contributes to rising health care costs.It is interesting to note that the price elasticity of health spending remains fairly high when onprend into account the rate of support. To assess the impact of demographic conditions on health spending, two indicators of the age structure of the population were tested: from 65 years and over in the total population and the dependency ratio, which relates the population under 20 and over 65 to the population aged 20 to 64 years. The first expresses the increase in life expectancy, while the second is a demographic indicator, which reflects a more complete distortion of the pyramid.

To construct a measure of technological medicine, we can first observe the rate of treatment of a disease whose frequency of occurrence was stable over the observation period. And frequency of chronic renal failure treatment is often used. With this in mind, we tested the frequency of kidney transplantation, the dialysis, renal failure and that of being treatments. Only the latter was significant (at the 10% level and only when the estimation begins in 1970).

In previous margin, the impact of other indicators was also tested without success. This is the case of the share of public expenditure in total expenditure on health, which expresses the structure of the request, the average length of stay in hospital, or the relative income of doctors in relation to the rest of the population . The direct impact of the provision of care has finally been tested with variable density medical, these variables were not found to be significant, which confirms the difficulties economists to validate fully satisfactory manner the hypothesis of induced demand.Finally, four variables included in the estimate used: GDP per capita volume index of relative prices, the rate of support for health spending, and an indicator of technological progress. The following table summarizes the estimation results for the period 1985-2010 according to what considered a trend and various indicators of medical technical progress (the / Student brackets). The last two lines of the table show the results of the stationarity tests of Dickey-Fuller Engel and Granger. The null hypothesis of the existence of a cointegration relationship is accepted in all cases at the 1 or 5%. Indicators of progress technique involving the volume of spending therapeutic devices coexist with a trend, which changes, moreover, that their low coefficients (models 1 and 2). This is not the case of the rate of renal treatment is not significant in the presence of a linear trend.

These estimates therefore seem generally quite satisfactory, although the small number of observations and the number of regressors encourage some caution. Based on the long-term relationship model 3, the standard error is smaller in the absence of autonomous trend was calculated for illustrative contributions of each determinant in the evolution of health expenditure between 1970 and 1995 by allowing simulation successively each explanatory variable to its initial level (Table 1). Beside the standard of living, which explains almost half of the increase in health care costs, the decline in relative prices have helped to foster the growth of spending from the mid seventies. And it explains about a quarter of expenditure growth over the last twenty-five years.
The rate of support for health spending by government influences more marginal. It would have accounted for about 8% spending growth since 1970, which is consistent with the results of studies of the OECD. The effect of aging has not been highlighted in the estimate and would be negligible.

Finally, the impact of technological medical, measured here by the volume of expenditure therapeutic hospital beds, explains a quarter of the increase in health spending over the period 1985-2010 (see Table 1). Remember that this contribution is roughly estimated as we have used an indirect measure of technological medicine.The estimation of a function of health expenditure on time series in France therefore confirms in part the teachings of empirical studies conducted in multinational cross. The growth of health spending in France since the early seventies is very sensitive to changes in the standard of living, as measured by GDP per capita. The price elasticity of health expenditure in France is also quite high, even when taking into account the supported by the welfare system, which also has a significant impact on the amount of health care spending. Medical technical progress has significant influence and explain almost a quarter of the increase in health spending. Finally, the aging population and the changing demographic structures would have had a marginal impact. (See Table 1 and Table 2)

Table 1: Contribution of explanatory factors in the growth of health spending

	Growth health spending Effect	income effect	relative price effect	Rate support	Technical Progress	Résidue
Growth rate (in%)	122	51	29	8	32	3
Share in total (in%)	100	41	23	6	26	3

Table 2: Estimation Results

Models	1	2	3
Constant	-2.39	-2.35	-3.29
Log GDP per capita	0.61	0.54	1.03
Log in relative prices	-0.97	-0.97	-1.24
Rate support	0.025	0.023	0.020
Trend	0.014	0.022	
Insuffisants rénaux			0.21
Expenditures by therapeutic appliances hospital beds	0.15		0.14
Expenditures per physician therapeutic devices	0.14	1.44%	1.72%
Standard Erreur		1.82	1.57
Durbin Waston	1.54%	0.9987	0.9983
R^2	1.74	-4.42(**)	-3.76(**)
Test de Dickey-Fuller	0.996	-2.12(**)	-.41(*)
Test de Dickey-Fuller augmenté	-4.16(**) -2.25(*)		

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