# The Health Care System and Its Fiscal Impact in Colombia

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## Abstract

This document analyzes the structure of the health care system in Colombia with the aim of establishing the magnitude of the public fiscal deficit generated by such a system. We first explain its complex funding structure (full of "cross-subsidies") and then we run simulations to establish the public sector financial gap. Based on these results we compute the Net Present Value (NPV) of the health care service's (actuarial) liability, as the system increases coverage from the current 86% to the recently announced target of universal coverage by year 2012. Our base-case scenario shows an estimate of a NPV of public liabilities of about 97% of GDP (of year 2007) over the period 2007-2050, which is of similar magnitude to the pension system liability established after recent "parametric reforms" to the *Pay-as-you-go* System.

June 2008

**JEL Classification**: Health Care Systems (I-180); Social Security (H550); Latin America. (O-540).

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## I. Introduction

The literature of labor economics identifies at least three salient stages regarding social security developments at the global level. The first era was born in Germany in 1883: Chancellor Otto Von Bismarck had a visionary idea that initiated a compulsory savings-system allowing the State to guarantee universal pension benefits. Hence, as the population aged, citizens had access to the deferred savings accumulated during their working days and the State avoided dealing with poor, out-of-work individuals (Clavijo, 2003).

In the second stage, this system expanded throughout Europe with minor idiosyncratic differences and even reached across the Atlantic to the United States, where several labor compensation packages were developed over the years 1901-1928. With the arrival of the Great Depression in 1929-1931, the desire to enlarge and secure these labor benefits grew substantially, leading to the well-known New Deal (1935-36) impelled by Franklin Delano Roosevelt. The New Deal not only increased unionization but formalized unemployment insurance and made pension and health benefits part of *regular labor arrangements* (Krugman, 2007 p.35).

Initially, the funding of such programs relied on the financial muscle of large firms. These firms perceived benefits packages (not subject to taxes) as a means of attracting highly sought-after skilled-labor. This was deemed preferable to an open "wage-war," which would entail a significant increase in direct labor costs, especially in an environment in which union affiliations had increased from 10% to nearly 30% between 1930 and 1947.

It is also worth noting that, during the 1940s, the US government mandated "progressive" wage adjustments (with a premium for lower-strata workers), recognizing that market competition for skilled-labor was taking place solely through the expansion of social security benefits. This combination of government intervention and free market competition ended up generating substantial improvements in the income distribution of the United States and better living-standards for an enlarging medium-class. Krugman (2007 p.48) has termed this social improvement (in relative and

absolute terms) as the period of the "great compression" of income differentials, where cementing social security benefits would mark an era perceived as the "American Dream".

However, American firms could afford to provide benefits packages only as long as technological advantages allowed them to maintain superiority over worldwide competition. With global competition reaching new heights in the 1980s and 1990s, US firms were hamstrung by the massive social security costs on their balance sheets. This change in the competitive landscape compelled the rise of a third stage in social security development, which could well be termed the era of the outsourcing and off-shoring. This stage, unfortunately, has resulted in increasing labor informality and the loss of prized social security protection in both developed economies and so-called emerging markets, which had attempted to replicate the successful path followed by the US in the golden period of 1935-1950. Health care coverage linked to company payrolls fluctuated between 57% and 65% during 1993-2001 (just before the recession) due to the normal economic cycle in the United States. Yet more recently (2005-2007), coverage has dwindled to less than 60% with a markedly declining path. Moreover, globalization, free-trade agreements, and abundant immigration into the US have combined to generate acute market competition; many corporations, including well-established multinationals, have responded by looking to cut labor and social security costs.

During this third stage (early 1990 onwards), much debate has arisen in the United States - where health care coverage currently stands at only 85% - regarding the best way to propel drastic health reform aimed at providing universal coverage. While diverse, most proposals are based on taking advantage of synergies in a mixed public-private system, which should look for ways to deepen Medicare and Medicaid, at a marginal cost of about 4% of GDP (Krugman, 2007 p.237).

Despite the potential for market failure extant in this and any other health care system (most notably due to adverse selection and "moral" hazard), Canada, the United Kingdom, and Germany have demonstrated that public-private systems can mitigate the elevated costs stemming from such market imperfections. Nevertheless, the case of Singapore, with the Quality Years System (Qualy), where citizens possess "individual

health care accounts" similar to pensions, also merits examination (Harford, 2007 p. 125ss).

The trajectory of US social security development (first, the attempted establishment of universal pension benefits; second, compulsory wage increases; and now in the third stage, the drive toward universal health care) possesses much in common with the path followed by Latin America. In the specific case of Colombia, compulsory wage increases came first with the movement toward unionization (1940-1950); the attempted establishment of universal pension benefits, through the creation of the *Instituto Colombiano de los Seguros Sociales* (*ISS*), followed in 1967.

However, this *pay-as-you-go* system quickly dissolved into crisis as a consequence of low participation rates - only 23-25% of the labor market contributed. In response, the government carried out Law 100 of 1993, creating a dual public-private competitive system in which new generations were given the opportunity to migrate to defined contribution private accounts run by the so-called *Administradoras de Fondos de Pensiones (AFP),* partially mimicking some elements of the Chilean reform of the early 1980s.

The aforementioned Law 100 of 1993 also ambitiously set the goal of attaining universal health coverage in Colombia, based on a very complex system of "cross subsidies". Paradoxically, what has taken the "advance countries" more than a century to pursue is now being attempted by Colombia after just 40 years, albeit at a much higher fiscal cost (with the exception of comparisons to the US-economy).

At this point, there are two key-elements worth highlighting regarding social security coverage projections. The first element involves the early warnings provided by Colombian economists in the mid-1990s about the forthcoming exhaustion of actuarial reserves within the *pay-as-you-go* system, as younger generations migrated toward the *AFPs*. In fact, the public system began using general taxes to pay for pension benefits as early as 2004 (less than four decades after the launching of the *pay-as-you-go* system). Because the system continues to involve only 25-27% of the labor market and a very regressive social scheme, the central government was forced in 2007 to allocate about a

third of total tax revenue (equivalent to almost 5% of GDP) to covering the pension benefits for just one million retirees (6% of the Colombian employed population).

The second element deals with the "contingent liabilities" inevitably generated by expanding the health care system, particularly as the Colombian population begins to age and demand for both medical attention and medicines expands (with no apparent limit). The population census conducted in 2005 indicates that, by the year 2050, the percentage of the total population comprised of people over 60 years of age will have tripled to 18%.

Given previous experience with social security overruns and the recognized burden of an expanded health care system, it is astonishing that official figures in Colombia lack a "consistent" estimate of the fiscal impact of instituting health-universal coverage, though some progress has been made with respect to understanding public-private health expenditures (Baron, 2007). This lack of consensus might be attributable to the complexity of the accounting system, as it deals with multiple public layers (national government vs. local governments; contribution systems vs. compensation systems) and multiple private layers (the insurance-component known as *EPSs* Vs. the service-component known as *IPSs*).

This document analyzes the structure of the health care system in Colombia with the aim of establishing the magnitude of the fiscal deficit generated by such a system. After explaining its labyrinthine system of compensations and "cross-subsidies," we run simulations with the intention of approximating the financial costs implied by arriving at universal coverage from the current measure of 86%. Finally, based on these results, we compute the Net Present Value (NPV) of the fiscal deficit likely to be generated over the period 2007-2050. Our base-case scenario shows an estimated NPV of public liabilities of about 110% of GDP (using year 2006 figures), which is of a similar magnitude to the pension system liability established after recent "parametric reforms" of the *pay-as-you-go* system.

From the outset, this result seems consistent with coverage rates and the funding scheme. The budget for the health care system presently relies on governmental subsidies for approximately 2/3 of its funds, instead of the 1/3 originally planned back

in 1993, meaning its fiscal impact is already significant (Clavijo and Torrente, 2007; Fedesarrollo, 2005). Furthermore, the contributed (non-subsidized) portion of the health care budget relies on payroll taxes amounting to only 12.5% of wages. Unfortunately, the fiscal imbalances common in health care systems tend to be corrected through restriction of service, potentially through augmented "waiting- lists" and/or through decreased quality: thus, both providers and patients stand to lose.

This has proved the story in developed countries, in spite of wide differences in the efficiency of health care systems. For example, while the US economy shows health care expenditures of about 12%-16% of GDP and coverage of 85%, the UK exhibits expenditures in the range 6%-8% of GDP and quasi-universal coverage (Harford, 2007 p.113). Health care expenditures in Colombia have recently been estimated at 8% of GDP but coverage remains low at 86%, indicating a system that replicates the deficiencies of the US system while possessing few of the virtues of the British system.

In effect, our preliminary calculations (holding constant epidemiological factors currently being studied by DNP) indicate that the fiscal deficit caused by the Colombian health care system is on the order of 1.1%-2.0% of GDP annually, depending on crucial assumptions regarding supplementary healthcare expenditures (in addition to the "compulsory health care plan", *POS*). With the structural fiscal imbalance of the central government approximated at 4% of GDP, the figure of 2.0% of GDP seems consistent with macroeconomic figures.

Supporting this relatively low estimate is the fact that the period 2007-2012 will likely witness an increase in health care system contributions collected through payrolls as labor dynamics improve and labor informality is reduced. Open unemployment has diminished from an average of 17% during the difficult years of 1998-2003 to 11% in 2007; it even dropped to almost 9% at the end of 2007, though high payroll taxes (about 37% for firms) and an inflexible labor market (particularly due to onerous severance payments) are likely to impair further sustainable improvements. Moreover, the level of social security contributions has marginally improved to 39% of the labor market by end-of 2007, partly as a result of the recently instituted surveillance system known as PILA (yet this figure is about half of the contributions rate observed, for example, in Chile).

On the other hand, health care expenditures will also be increasing due to the aging of the population and increased life expectancy (currently 72 years in Colombia and 75-78 years in developed economies). The net outcome of these two countervailing effects, according to our calculations, will be an increase in the fiscal deficit caused by health care expenditures from the current level of 2.1% of GDP to 3.8% by 2035; a stabilization will occur thereafter with the percentage of GDP falling to 1.8% in 2050.

Given this fiscal trajectory, we have estimated the NPV of future health care liabilities to be 110% of GDP (of year 2007), a figure similar to the calculated NPV of pension liabilities (in the range of 140-160% of GDP), taking into account the 1993 and 2003-2006 "parametric" reforms. However, as is well known, health care represents a uniquely challenging fiscal case in that its expenditure side cannot be easily bounded and, on the income side, estimates of contingent fiscal obligations are likely to force governments to continue increasing tax collections through different means (Clavijo, 2004).

In the second part of this study we will describe the current institutional framework of the health care system in Colombia, including the reforms occurring 1993-2007 and, notably, the possible effect of "integration limits" ratified in Law 1122 of 2007. The third section presents fiscal simulations and NPV computed over the period 2007-2050. Finally, chapter four is devoted to concluding remarks.

## II. Health insurance system structure in Colombia

Law 100 of 1993: cross and demand subsidies

The Health Care Social Security System (HCSSS), introduced by Law 100 in 1993, effected fundamental changes in the industrial organization and day-to-day functioning of the health care system in Colombia. The main objective of creating a general insurance system was to achieve universal health care coverage. It is worth noting that at the beginning of the 1990s, just 28% of the population possessed health care coverage. Furthermore, it has been estimated that the private sector directly accounted for nearly 45% of hospital admissions and about 40% of medical appointments, suggestive of a relatively expensive health care system with extremely limited coverage.

Before Law 100, the health system was divided in three sub-systems: 1) a social security area, in which the ISS tried to handle simultaneously the insurance and health services provision tasks for its members; 2) a public network consisting of a complex and inefficient regional hospital structure; and 3) a private system, expensive in per capita terms and inclusive of only the highest socioeconomic strata.

Law 100 dismantled this disjointed system and constructed in its place a single insurance system based on the principle of "cross subsidies" between two components: the Contributive System (CS) and Subsidized System (SS). The Contributive System divides the insurance cost between the employer and the employee, provided the employee has adequate financial resources. The Subsidized System includes only individuals who lack the financial wherewithal to cover health care contributions; the government assumes these costs.

Fundamentally, Law 100 based the health care system on *Empresas Promotoras de Salud* (*EPS*), the insurance component firms. The *EPS* were commissioned with health care risk redistribution as well as with managing the mandatory basic health care plan known as *Plan Obligatorio de Salud* (*POS*), while the supply of services of this plan was to be provided via the service component, *Instituciones Prestadoras de Salud* (*IPS*). The *EPS* were permitted to create their own *IPS*, thereby integrating the entire insurance-health care services process.

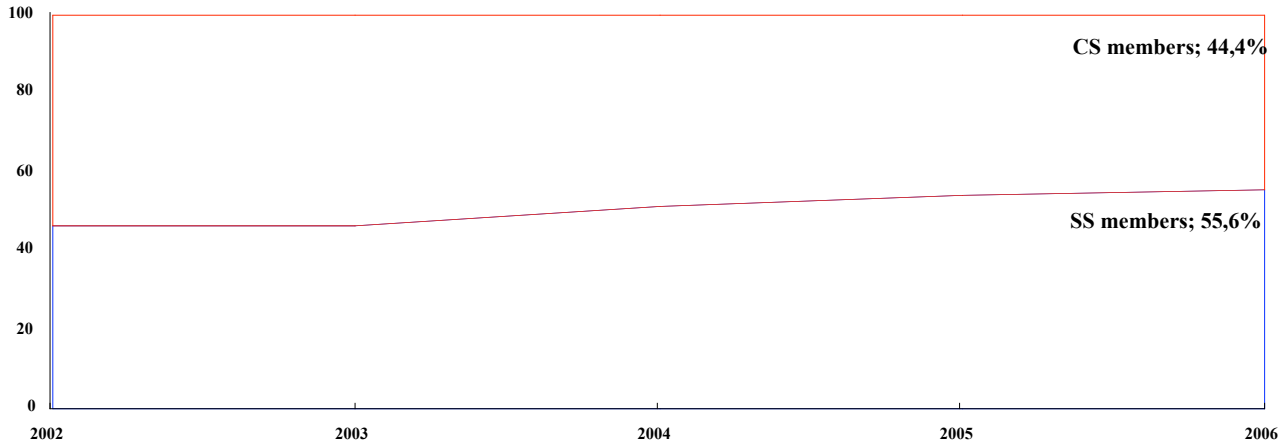
The *Fosyga* (*Fondo de Solidaridad y Garantía*), a public institution affiliated with the Ministry of Social Protection, serves as the principal mechanism for distributing funds to the *EPS* and SS, by means of the aforementioned "cross subsidies". After receiving the revenue generated by payroll taxes, Fosyga allocates the nominal value of the *POS* per person (known as the *Unidad de Pago por Capacitacion*, or "*UPC*") to each *EPS*, for every individual that particular *EPS* covers; the remaining funds *Fosyga* has taken in from payroll tax revenue are then directed to the SS. The gap between these funds and the total projected expenditures of the SS must then be supplied by the government.

The mandatory basic health plan represented by the *POS* differs between the two systems, as the plan offered in the CS is more extensive. Moreover, within the SS there are two different *POS*: the full subsidy and the partial subsidy; the full subsidy

comprises a more complete service scheme. With time, it was expected that the number of members of the SS proportional to total contributing workers would decline, thus allowing the SS *POS* to get better in terms of both quantity and quality, eventually reaching the level of the CS *POS*. In theory, the contributive system was to have financed 2/3 of health care costs, with the remainder coming from the government.

As we will demonstrate, this hasn't been the case: in fact, the health care system's sustainability is being threatened (under the current structure) by the fact that roughly 55% of costs are financed on the non-contributive side (i.e., by the government) (see figure 1). Furthermore, this fiscal burden has prevented the *UPC* from being raised, therein restraining the possibilities for improving and expanding the basic health services represented by the *POS*. However, it is worth noting the improvements in health care coverage this fiscal burden has made possible: at the end of 2006 about 86% of the population had health insurance. Public spending on health care has also remained at such high levels in part because of special health care programs that still exist outside of the system described above, including the programs of the National Army, the National Petroleum Company "(*Ecopetrol*)" and the National Council.

**Figure 1. Members of the Contributive and Subsidized Systems 2002-2006 (% of HCSSS population)**




Source: Ministry of Social Protection and calculus Anif

Another crucial change brought about by Law 100 resided in the realignment of the system underlying subsidies from supply-side to demand-side. In other words, instead of directly assigning public resources to the public hospital network and other health entities, Law 100 directed these resources toward the users of health care services with the intention of stimulating competition among the renderers of such services.

The regional public health care entities faced serious difficulties in learning how to alter billing procedures with this new mandate, resulting in a slow transition from the "supply system" to the "demand system". The private sector, on the other hand, has successfully adopted the new system, vertically integrating the insurance and services components (*EPS-IPS*) as well as the *Administradoras de Riesgos Profesionales (*responsible for health care insurance coverage on the job-accidents, *ARP )*, therein gaining important synergies. This proved such a success to highly integrated providers that vertical integration between *EPS-IPS* was restricted by Law 1122 of 2007 (to 30% of services contracted by *EPS*), with the intent of controlling quality and continuing to stimulate competition among health care service providers.

With regard to *Fosyga*, it administers four subordinate accounts: solidarity, compensation, promotion & prevention, and catastrophe & traffic accident risk (ECAT). The compensation sub-account manages the contributions from members of the CS to the *EPS*; the solidarity sub-account handles the joint financing resources of the CS and the SS that fund the "cross subsidies," and correspond to 1.5% of the total health care contributions made by firms and self-employed workers. In 2007, Law 1122 raised the obligatory contribution of the special health care programs (National Army, etc.) to the solidarity account by 0.5%.

Health coverage progress

Important progress was made between 1995 and 2006 with respect to health care coverage. The number of SS members rose from 4.8 million (12.4% of the population) to nearly 20 million (about 46% of the population), whereas CS membership tripled from 5 million (13% of the population) to almost 17 million (40% of the population). Hence, 86% of the Colombian population nowadays has health insurance, with 55% of those belonging to the SS and the remaining 45% to the CS. This statistic of 86%

coverage represents a major improvement over the 28% coverage level reported before the enactment of Law 100 of 1993. Moreover, the aforementioned special health care programs (e.g., for the Military) cover an additional 5% of the population, such that total health care coverage actually reaches around 90% of the Colombian population. Thus, Colombia continues drawing nearer to universal coverage, though the mandatory basic health plan's (*POS*) service quality and quantity still has substantial room for improvement.

The annual cost of providing health care coverage to the 6 million people currently uncovered is projected at $1.3 billion (2006 prices) while estimates from the Ministry of Social Protection show that maintaining universal coverage would likely be on the order of $6.5 billion (2006 prices). Although Law 797 of 2003 and Law 1122 of 2007 increased the payroll tax destined for health care expenditures from 12.0% to 12.5%, this implies additional tax revenue for the government of just $400 million annually, resulting in a total of $1.5 billion. Thus, the staggering remainder of $4 billion (=$6.5-$1.5), equivalent to 1.6% of annual GDP, must come from the fiscal budget. Additionally, raising taxes stimulates labor informality and therefore means higher costs will be borne specifically by the subsidized system.

Fiscal decentralization in the health care system

Fiscal decentralization in the Colombian health care system was implemented by Law 60 of 1993 and Law 715 of 2003. Each piece of legislation extended the so-called *Sistema General de Participaciones* (*SGP*), which determines the regional and local transfers made by the central government.

The main objective of Law 715 was to reduce the volatility in the financial resources designated for social investment, given the variable nature of the government's income at the time. The nation distributes 15% of the *SGP,* previously known as the "*Situado Fiscal,*" to different regional entities and the remaining 85% to the particular expenses of users of education and health care services; of the funds represented by this 85%, 60% must be committed to education, 25% to health care, and the remaining 15% to the sector with the more urgent needs.

Figure 2 illustrates how the *SGP* resources were distributed in 2006, among education (60%), health (25%) and general purposes (15%). Total resources committed to the health care sector added up to $3.5 billion, a sum which in turn was allocated as follows: 48.3% for demand subsidies to maintain the current coverage level; 38.3% to supply subsidies; 10.3% for public health awareness (funding, for example, campaigns for disease prevention), and 2.3% for attempts to raise coverage.

As we explained previously, one of the principle objectives of Law 100 of 1993 was the reallocation of resources from the public hospital network to demand subsidies. However, statistics show this transition has not occurred as rapidly as hoped. For example, while supply-side subsidies fell from 42.7% to 26.9% of total subsidies between 1996 and 2003, demand subsidies only increased from 6.4% to 14.5% during the same period. Nevertheless, CS expenses increased to 58.5% of total health care expenditures in 2003, up from 50.9% in 1996.

Health expenses composition and international comparisons

In 2003, Colombia spent the equivalent of 7.7% of GDP on health care after averaging 8.5% of GDP from 1998-2002. These expenses surpass those of Chile (5.9% of GDP) and Mexico (5.7%). In addition, when compared to other Andean countries, Colombia's health care expenses seem even higher: in recent years, Ecuador allocated only 4.8% of GDP and Venezuela, 5.4% of GDP, to the health care sector.

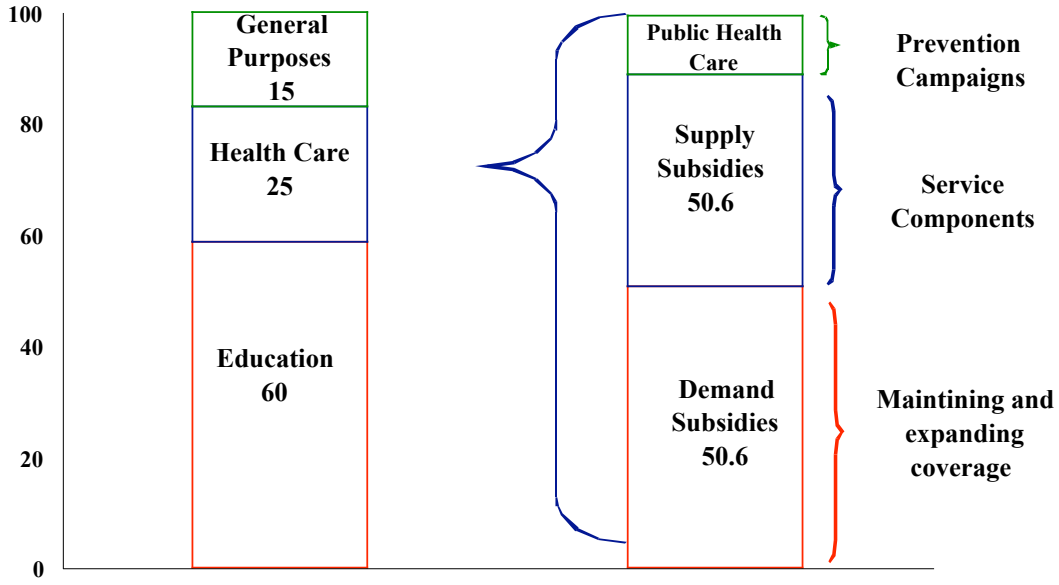
When compared to developed world allocations, though, it could be argued that the allocations to health care of other Latin American countries, particularly Colombia's Andean compatriots, are far too low. Indeed the average health care expenses for the period 1998-2002 for Britain added up to 7.3% of GDP and 7.6% for Japan. According to Baron (2007), Colombia has recently witnessed one of the most pronounced increases in health care spending, going from 6.2% to 7.7% of GDP between 1993 and 2003. In parallel, health insurance coverage rose from 28% to 83% over the same period.

Disaggregating total health care expenditures shows that between 1998 and 2002, public spending accounted for 78.3% of total health care expenditures. Cuba was the only country with a greater level of public spending (85.7%), while other Latin American

countries such as Chile (41.2%), Mexico (46.0%), and Venezuela (50.3%) recorded public expenditures far below the Colombian level. In the United States and Switzerland, both developed countries, public spending between 1998 and 2002 amounted to, on average, 47% and 56% of total health care expenditures respectively.

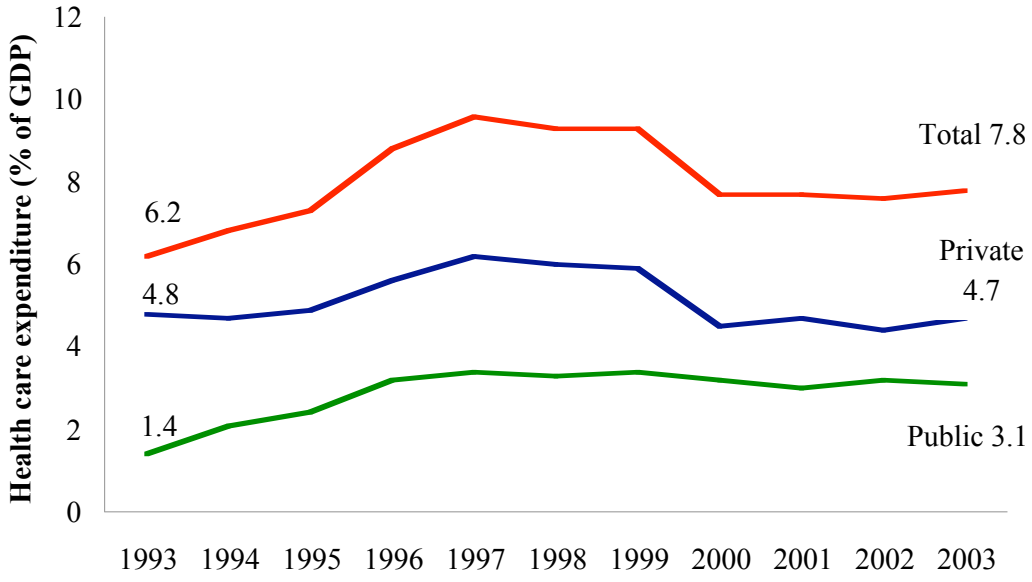
The Colombian case, as we noted above, has shown a slight decline in total health care expenditures starting in 1998 and stabilizing at around 7.7% of GDP. This is due, in part, to the economic crisis of 1998-2002, when a diminution of government revenues reduced regional transfers, adversely affecting the SS; increased unemployment and labor informality also contributed to the decline in spending (see figure 3).

**Figure 2. National health care transfers by sources and uses (%, 2006)**




Source: Ministry of Social Protection and calculus Anif

**Figure 3. Health care spending in Colombia 1993-2003**
**(% GDP)**




Source: Ministry of Social Protection and calculus Anif

## III. Health care fiscal deficit estimation and its Net Present Value (2006-2050)

Two types of factors determine health care cost evolution (Oliveira-Maisonnueve-Bjornerud, 2006). Demographic factors are those such as population growth and the epidemiological profile of the population, while non-demographic factors may include income and technology. This paper will focus on the effects of the non-demographic variables such as institutional arrangements in the health care system. This will enable us to establish the fiscal deficit evolution between 2007 and 2050 in Colombia and its (approximate) NPV.

Leaving constant the epidemiological profile is consistent with the hypothesis that life expectancy increases in parallel with healthy life-years. Thus, an increase in the proportion of the population over 60 years of age does not necessarily mean a relative increase in health care costs. Furthermore, as the number of individuals with health insurance grows, per capita costs stabilize. Additionally, OECD studies have shown that health care spending increased at annual rate of 3.6% between 1981 and 2002; 0.3% of

the growth is explained by demographic factors, 2.3% by income factors, and the remainder by institutional and political variables.

According to the calculations of DANE and DNP, in 2006 the total population of Colombia measured approximately 43.4 million. That number is expected to reach 50.8 million by 2020, as the population grows at an annual rate of 1.18% from 2006 to 2010, 1.13% the following five years, and 1.09% between 2016 and 2020. We assume that the population will grow at a steady annual rate of 1.0% in the years 2020-2050, and that life expectancy will remain constant at 72.6 years of age (see table 1).

In 2006, about 78% of the 43.4 million people comprising the Colombian population were considered of working age, defined as 12-65 years old, and about 53% of this working age population (WAP) was employed. In general, the WAP/Population ratio has remained constant in Colombia, and resultantly, we will use this scenario in our calculations. It is also worth noting that the ratio of Employed/ WAP plays a key, non-demographic role in affecting the demand for health care services.

Also in 2006, the number of active contributors to the Contributive System measured around 7.4 million people. Therefore the relationship Contributors/Employed was approximately 40%, evincing the high informality level and demonstrating the significant pressure on public health spending. As explained previously, the volume of contributors governs the spending power of the health care system by funding the *POS* and any additional health expenses, thereby dictating the private sector's equilibrium (or lack thereof).

One of the key economic policy variables in this model comes from the goal of health care coverage set by the government. As noted above, Law 100 of 1993 ended up placing the burden of the system on public resources, and it is expected that this situation will worsen between 2007-2012. Indeed the government's objective is to raise health insurance coverage in the SS to 24.8 million people, while increasing membership in the CS to 17.8 million. Given these expectations and the estimated population growth of 1.18% per annum, health care coverage would reach approximately 94% in 2010, with nearly 60% belonging to the SS and only 40% to the CS. This paper will assume that the government's goals will be achieved by 2011 and

therefore, that the SS Members / CS Members ratio will in turn be determined by the Contributors/Employed ratio.

Health care coverage will then be determined by the relationship between the number of contributors to the CS and relative family density, a ratio which in the past five years has averaged 2.26. Ideally, the members of the CS contribute enough such that after redistribution by *Fosyga* the *UPC* of all contributors is covered. However, the relative family density implies the existence of unaccounted for dependents: for every contributor of the CS, the system actually faces the cost of attending 2.26 individuals; moreover, these costs are faced at the real *POS* value, not the arbitrarily defined *UPC*.

**Table 1. Population estimates and health care-system members (million of people)**

| | 2006 | 2020 | 2050 |
|---|---|---|---|
| **Total population** | 43.2 | 50.8 | 68.5 |
| **Working age population (78%)** | 33.8 | 39.6 | 53.4 |
| **Employed population** | 17.9 | 21 | 28.3 |
| **Subsidized System members** | 20.1 | 26.8 | 34.3 |
| **Contributive System members** | 17 | 21.3 | 32.6 |

Source: DANE y calculus Anif.

Sources and uses of health care-system funding

The contributions to the CS represent the main source of income for the Health Care Social Security System (HCSSS). Taxes going to health care contributions accounted for 12.5% of the worker's monthly wage, where 8.5% is assumed by the employer and 4.0% by the worker. Additionally, 5.0% of the "parafiscal contributions" (payroll taxes, equal to 4.0% of the worker's wage, allocated to endeavors of social security) made to the *Cajas de Compensación Familiar* (*CCF*; subsidized non-governmental entities aimed at social welfare) will be spent on financing the demand subsidies of the SS.

CS's contributors are distributed in three wage ranges: high, medium and low. The high rank contributors have salaries between 10 and 20 times the Legal Minimum Wage (LMW); they represent 1% of total contributors; and they possess an average monthly

wage of 12 times LMW. The medium rank represents 12% of total contributors and on average earns 6 times LMW. Finally, the low range consists of 87% of contributors and has an average monthly wage of 2 times LMW (see table 2).

**Table 2. Contributive system by wage range**

| | Number of people (million) | Representation (%) |
|---|---|---|
| **Total** | 7.4 | 100 |
| **Low (>=2 LMW)** | 6.4 | 87 |
| **Medium (<2-10 LMW)** | 0.9 | 12 |
| **High (<10-20 LMW)** | 0.1 | 1 |

Source: Superintendencia Financiera and calculus Anif.

The system's expenditures consist of: 1) the mandatory basic health plan (*POS*); 2) out-of-pocket expenses; y 3) parafiscal contributions. The cost of the *POS* is supposed to coincide with the CS *UPC* value, which in 2006 equaled $408,000 approximately 8.3% of the LMW calculated annually. In the SS, demand subsidies are divided between: a) full subsidies (91% of the SS population is affiliated through this modality); and b) partial subsidies (9% of the SS population). The *UPC* value of the full subsidy represents 4.4% of the LMW, calculated annually.

Health care expenditures supplementary to the *POS* are represented by out-of-pocket spending. This estimate is based on sample results from 2001, in which the high wage-range spent 1.3% of the LMW calculated annually, the medium wage-grade, 2.4%, and the low-grade, 1.6%. Studies from the OECD have confirmed that the income elasticity of health care expenditures is greater than 1; thus, assuming out-of-pocket health care spending to be constant over time appears to be a consistent supposition. It is consistent as well, with the hypothesis that the high wage-range has access to supplementary health care plans representing a small fraction of their total income. For the SS members, out-of-pocket health care expenditures are approximated by the expenses of the *SGP* and the *Fosyga*. Given that, in 2006, health care supply-side subsidies accounted for $3.2 billion, we have inferred per capita spending (taking into account both the SS population and non-members) of $120,000 per annum.

Finally, it is well known that the government injects money into the health system by means of capital contributions to public hospitals and state health enterprises. Our decomposition of spending includes such contributions: in 2006 these expenditures summed $ 300.000 million on average, a cost of $ 100.000 per member of the ISS (20% of the total CS members).

As mentioned above, *Fosyga*, manages four sub–accounts; for the purposes of this study, however, we will focus only on the Compensation, Solidarity and ECAT accounts. We will leave out the Promotion-Prevention account (0.4% of the *UPC* value) and take into account these resources via *UPC* expenses. The budgetary support for populations displaced by violence (approximately 2.6% of the total population) represents a supply-side subsidy but is administered through the *Fosyga*.

Lawsuits presently compose a substantial fraction of today's health care obligations borne by the State (by way of the Compensation and Solidarity sub-accounts). Preliminary data suggest that nine of every ten lawsuits are resolved in favor of the patient, and the *Fosyga* must reimburse the *EPS* for these losses from the national budget. In addition, these two accounts must cover other health care expenses not included in the *UPC* and are compelled by law to offset the deficits of *EPS*, should these businesses suffer losses.

Base Scenario-Improved Labor Formality

Taking into account the evolution of both non-demographic and demographic factors, we have constructed three scenarios where the key policy variables are the government's coverage goal and the ratio Contributors/Employed.

The baseline scenario assumes: 1) population growth for five year periods as described previously (1.18% between 2006-2010; 1.13% between 2011 and 2015; 1.09% between 2016 and 2020; and 1.0% thereafter), reaching in 2050 an estimated total population of 68.5 million; 2) between 2006 and 2050, health coverage will increase gradually from 86% to 98% of the population; and 3) during the same period, the Contributors/Employed ratio will increase from 40% to 50%, corresponding to a rise from 7.4 million contributors to 14.2 million (see table 3).

As a proxy for the labor market formality that Colombia could potentially reach by 2050, we compared the correlation between GDP per capita and labor formality during the years 1979-2003 for, among other countries, Argentina, Brazil, Chile, Colombia and Mexico (see figure 4). Starting in 2007 at a GDP per capita of US$6.378 (PPP) for Colombia, and assuming GDP growth at 3% per annum, we determined that it would take about 50 years for GDP per capita to double. In other words, Colombia's GDP per capita in 2056 would be similar to Chile's in 2007, US$13.000 (PPP). Taking into account the positive correlation between labor formality and GDP per capita, we deduced that by 2050, Colombia could achieve a Contributors/Employed ratio of 70%, a ratio comparable to that currently present in Chile. Based on these results, we have constructed three scenarios in which the Contributors/Employed ratio varies from 40% to 60%.

The baseline year estimation corresponds to 2006, when total parafiscal health care contributions added up to $11.9 billion, including contributions to the so-called *Cajas de Compensación Familiar (CCF)*. The contributions to *CCF* accounted for a mere 1.5% of total contributions. By salary ranges, contributions were distributed as follows: 67% ($7.9 billion) came from the low range (6.4 million contributors earning, on average, two times the LMW); 28% from the medium range; and 5% from the higher range.

Total expenses consist of all expenditures made by the CS and the SS. In 2006, both *POS* and non-*POS* (out-of-pocket expenses) CS expenses added up to $10.8 billion. The *POS* spending accounted for $6.9 billion, of which $6.0 billion was allocated to workers in the lower wage-rank, largely due to the high proportion of members categorized in this wage range (14.8 million, or about 87% of all CS members). Non-*POS* expenses equaled $3.9 billion. In per capita terms (taking into account only CS affiliates) the *POS* expenses represent two times the Non-*POS* ($406.000 vs. $229.000).

In 2006, SS expenses added up to $7.2 billions, almost $356.000 per SS member. Total expenditure via demand subsidies accounted for 57% while the remainder was spent via supply subsidies (including direct fiscal donations to the ISS).

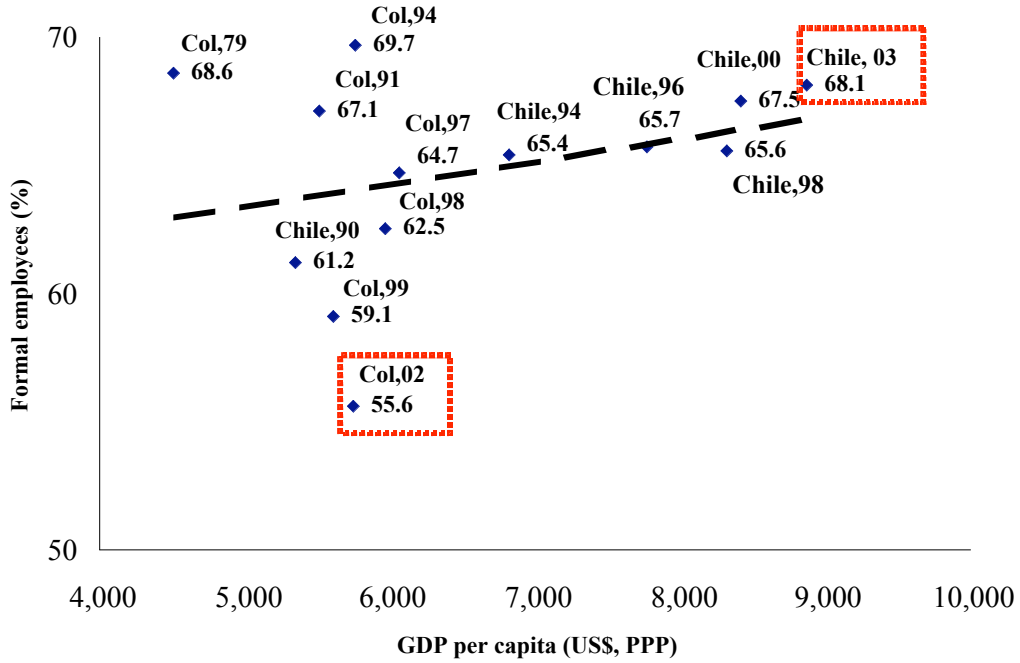
The revenue and expenditure balance (CS+SS) in 2006 showed a $6.2 billion deficit (1.9% of GDP), in which the CS surplus ($0.86 billion) only minimally offset the SS deficit ($7.2 billion). It should be noted that the SS deficit is, quite simply, equivalent to its expenses, given that this system does not receive wage contributions. It is also worth mentioning that while both the higher and medium wage range groups of the CS were in relative equilibrium, the volume of lower range workers produced a deficit of $480.000 million, a shortfall of $33.000 per member in the low wage range.

The private sector produced a slight $0.4 billion surplus (0.1% of GDP) in 2006, as contributions ($11.2 billion) surpassed total expenses ($10.8 billion). By contrast, the public sector recorded a $7.1 billion deficit (2.2% of GDP). In revenue terms, the public sector makes contributions to the HCSSS on behalf of one million employees (6% of all employed workers). These contributions, in turn, are divided between regional employees (5%) and central government employees (95%), the latter of which includes teachers and police.

The SS demand subsidies are funded by either the specific regional institution (which in practical terms is equivalent to the same nation's budget) or *Fosyga*. At present, regional or local authorities contribute 15% of the partial subsidy and 60% of the full subsidy with the remainder funded by the *Fosyga*, though some special cases, such as the prison population, exist. Unfortunately, as information about local and regional spending is virtually nonexistent, we will assume that the principle of fiscal decentralization supply subsidies, introduced by Law 715 of 2001, has been successfully implemented; this implies the assumption that SS Non-*POS* spending is fully funded by the *SGP*.

As a result of the foregoing, we have determined that in 2006, the health care sector in Colombia likely generated a $6.7 billion deficit, equivalent to 2.1% of GDP; this seems in accordance with the "structural" fiscal deficit level of 4% of GDP reported by the Central Government (CG).

**Figure 4. GDP per capita and labor formality correlation (1979-2003)**




Source: Social Outlook in Latin America, ECLAC (2007)

Health care deficit: trend and forecast 2006-2050

Using this 2.1% of GDP deficit in 2006 as a foundation, we have considered different population and employment variables, according to the criteria described above. Under the baseline scenario (gradual decrease of informality, corresponding to an increase from 40% to 50% in the Contributors/Employed ratio), the public health care deficit will reach a peak of 4.3% of GDP by year 2038; thereafter, it will stabilize in the range 3.0% -3.5% of GDP through 2050.

Figure 5 shows the deficit course between 2006 and 2050. Three important phases merit identification. The first phase, covering the years 2006-2010, is the HCSSS´s expansion phase, responsible for rapid fiscal deficit deterioration from 2.1% to 2.8% of GDP. In this stage, the government's ambitious coverage goal (4.7 million additional affiliates to the SS for a total of 24.8 million and 0.5 million to the CS for a total of 17.8 million) overwhelms the earnings contributions growth (0.7% of GDP in the four-year period).

In the interval 2010-2035, steady deterioration in fiscal performance is projected, attributed mainly to the system's organic expansion. The health care deficit would rise from 2.8% of GDP to a maximum of 3.8% of GDP. This behavior is explained by the estimated growth in the affiliated population, predicted to jump from 42.6 million to 56.7 million even though the total population growth is assumed to slow to 1% from 1.09%. Thus, the coverage increases from 94% to 96%, generating more expenses. On the revenue side, the relationship Contributors/Employed will remain in the 40%-47% range, improving contributions only marginally.

Finally, in the 2036-2050 period, the system stabilizes itself, reversing course and reducing the deficit from 3.8% to 1.8% of GDP, converging towards a value of 2% of GDP. This convex effect on health deficit is explained by the increase in CS contributors, thanks to marginal gains in labor formality: we assume the ratio Contributors/Employed will increase from 47% to 50% over the course of these years.

Another reason potentially explaining this "U" shaped health care deficit trajectory is the projected equilibration of membership in the SS and CS systems: SS and CS members should each account for 50% of all covered individuals at this point. Thus, our simulations highlight something obvious in terms of health insurance: the expansion of membership tends to correct structural imbalances in the long term. Indeed, as the population and labor formality grow (the Contributors/Employed ratio increases from 40% to 50%), and contributions rise, the fiscal deficit declines. However, our model suggests this increase is insufficient to compensate for total health care expenditures, resulting in a "structural health care" deficit of 1.8% of GDP in 2050.

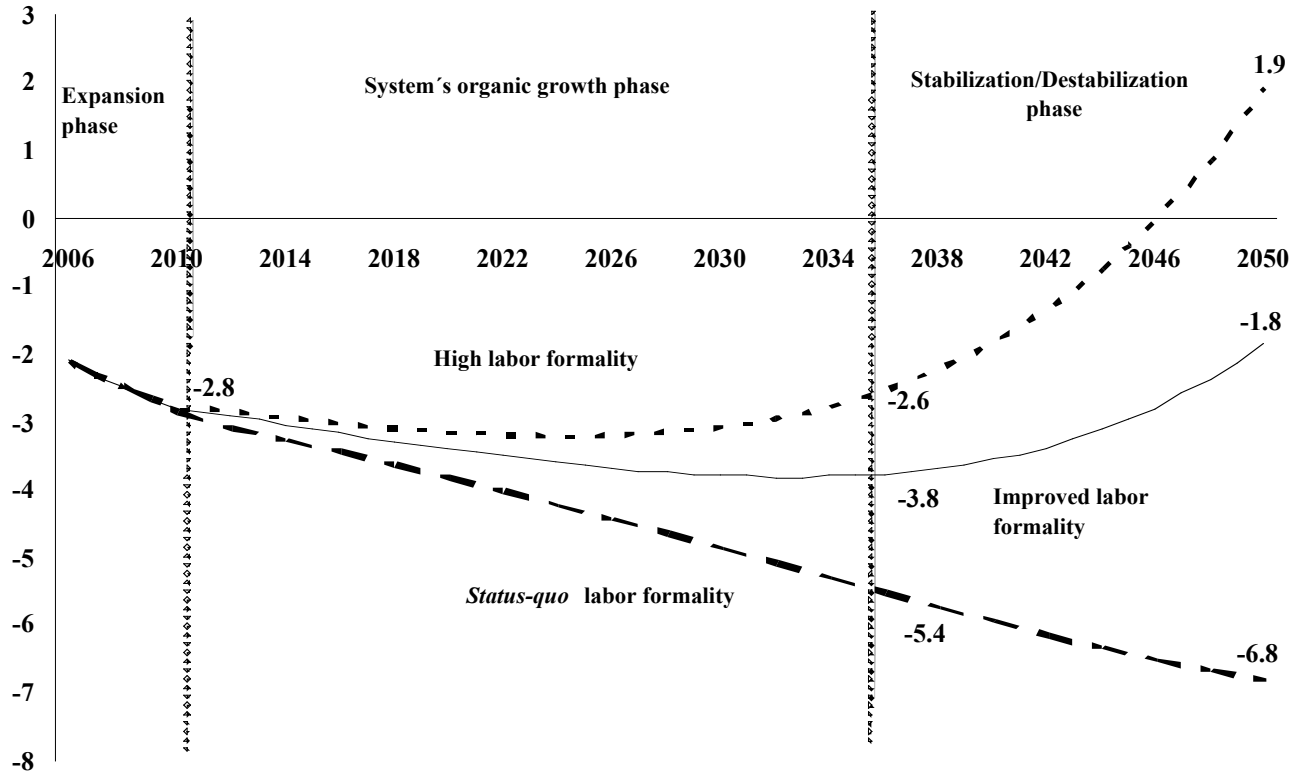
It is necessary to mention that if SS affiliates are calculated as the difference between the total population covered and total CS members (where total CS members is defined as contributors * family density), the demand subsidies/SS expenditure ratio increases from 57% to 61%, while supply subsidies decrease from 42% to 39%.

**Table 3. Baseline and alternative scenario assumptions.**

| | Improved formality | | | Status-quo formality | | High formality Improvement | |
|---|---|---|---|---|---|---|---|
| | 2006 | 2020 | 2050 | 2020 | 2050 | 2020 | 2050 |
| CS contributors/Employed (%) | 40 | 44 | 50 | 40 | 40 | 47 | 60 |
| (million) | 7.4 | 9.2 | 14.2 | 8.4 | 11.3 | 9.8 | 16.7 |
| HCSSS coverage (%) | 86 | 95 | 98 | 95 | 98 | 95 | 100 |
| (million) | 37.1 | 48.1 | 67.1 | 48.1 | 67.1 | 48.1 | 68.2 |
| Health Care sector deficit (% GDP) | -2.1 | -3.3 | -1.8 | -3.8 | -6.8 | -3.1 | +1.9 |

Source: calculus Anif.

**Figure 5. Health care deficit trend and forecast 2006-2050**
**(% of GDP)**




Source: calculus Anif.

Scenario 2: S*tatus-quo* Labor Formality

In this scenario we assume: 1) population growth is the same as stated in the baseline scenario; 2) health care coverage will increase gradually from 86% to 98% during 2006-2050, and 3) the ratio Contributors/Employed will remain constant at 40%, implying an absolute increase in contributors from 7.4 to 11.3 million (i.e., the number of contributors is 2.9 million less than in the baseline scenario; see Table 3).

Under this scenario of minimal informality improvement, severe fiscal deterioration results, with excess health care spending reaching 3.8% of GDP in 2020, about 50 basis points higher than the deficit recorded in the baseline scenario. Moreover, no phase of stabilization is ever reached, meaning that in 2050 the health care deficit will account for 6.8% of GDP (see figure 5).

Scenario 3: High Labor Formality Improvement

This scenario assumes: 1) population growth is the same as stated in the baseline scenario; 2) health care coverage will increase gradually from 86% to 100% during 2006-2050, and 3) the Contributors/Employed ratio will rise faster than in the baseline scenario, increasing from 40% to 60% in 2006-2050, or, in absolute terms, from 7.4 million to 16.7 million contributors (2.5 million more than in the baseline scenario; see Table 3).

Under these conditions, the health care sector would reach its maximum deficit of 3.2% of GDP in 2024, a peak almost 60 basis points of GDP less and reached 11 years earlier when compared with the maximum deficit projected in the baseline scenario. Thus, in this alternative scenario, the "growth phase" would have a shorter length (2010-2024) and the "stabilization phase" would begin much sooner, in 2028. Even more propitiously, the health care sector would actually record a 1.9% of GDP surplus in 2050 (see figure 5).

This favorable result is explained by the greater degree of labor formality, which significantly augments the number of contributors. Indeed, with such high formality of labor, it would be possible to attain universal health coverage and actually turn a surplus

of 1.9% of annual GDP (assuming no unforeseen epidemiological risks come into play). The importance of unifying membership data through the surveillance systems PILA and BDUA – and therein preventing evasion of contributions - is thus underscored: increased contributions are capable of correcting the structural fiscal deficit that results from health care expenditures.

**IV. Health sector contingent liabilities estimation (2006-2050)**

In order to estimate the present health care obligations of the Colombian government on a 50-year horizon, we proceeded to calculate the Net Present Value (NPV) of the obligations projected by the baseline scenario described above.

Two scenarios were created with different interests rates. The first scenario considers a 4% long-term interest rate. This long-term passive rate is equal to the opportunity cost of the State's health care obligations accumulated between 2006-2050. Under this scenario, the State's gross health care obligations (corresponding to public spending) between 2006 and 2050 equate to 110% of 2007´s GDP (see Table 4). Once income is deducted, the net public duties are reduced to 97% of GDP (2007); on the other hand, the private sector would show a surplus of +35% of GDP (2007) in the period 2006-2050. Adding the public sector deficit and the private sector surplus thus gives the health care sector's NPV stock: -61.4% of GDP (2007).

Preliminary calculations have shown that the contingent liability of Medicare in the United States, excluding medicines, measures approximately 90% of year 2007 GDP. Including medicines, the liability increases to 259% of GDP (see figure 6). In other words, if the US government continues to spend US$ 2 trillion annually on health care, an additional gap of US$600 million will be generated each year.

Given the substantial inefficiency that characterizes the health care system in the United States, it seems consistent to think that the contingent liabilities in the USA (including the Medicaid component), surpass those of Colombia. We also believe that our result of a NPV around 110% of GDP (2007) is consistent, for example, with the Colombian pension fund system's liabilities of approximately 160% of GDP. Incidentally, this

implies a Health Care Liabilities/Pension System Liabilities ratio inferior to that of the United States (61% vs. 221%).

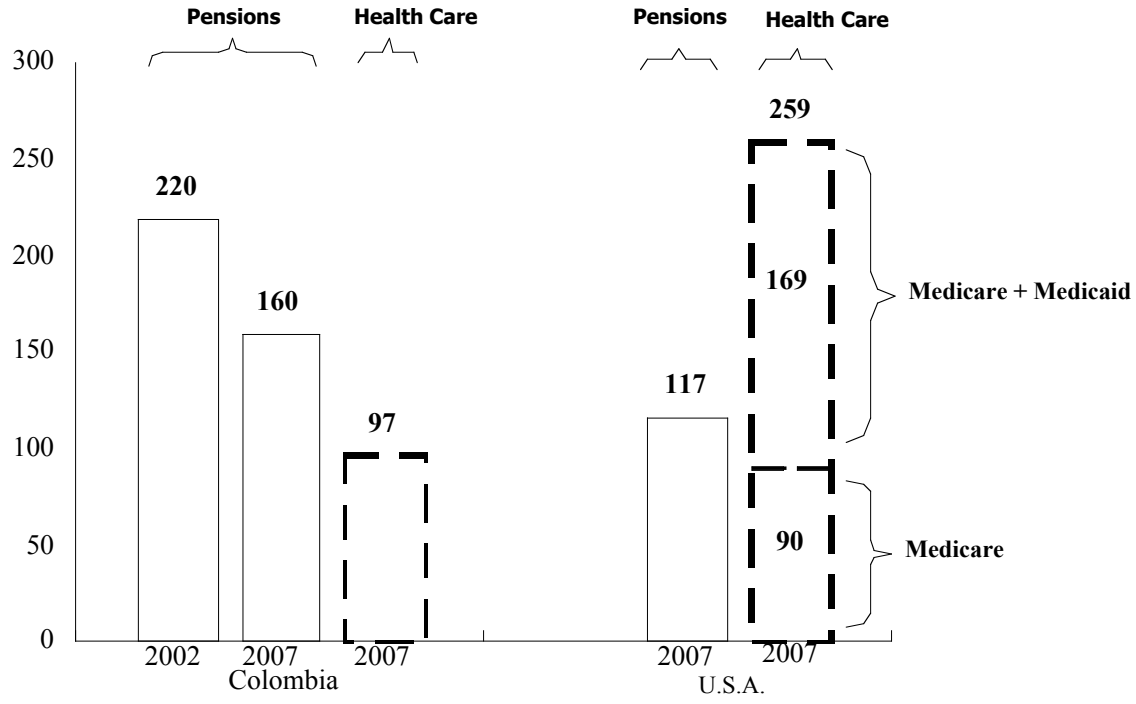
When calculating health care's NPV using a 5% long-term interest rate, the net public obligation was found to be 80.1% of GDP (2007). This is 17 percentage points less than that obtained with the 4% rate. In this case, the NPV Health/Pensions relationship would fall to 50%.

**Table 4. Health care NPV by type of Obligations**
**[% GDP of 2007; surplus (+) or deficit (-) ]**

| | i=4.0% | i=5.0% |
|---|---|---|
| **Gross public spending** | -107.0 | -90.5 |
| **Net public duties (deficit)** | -96.9 | -80.1 |
| **Net private spending (surplus)** | + 35.5 | + 27.2 |
| **Total balance (public+private)** | -61.4 | -52.8 |

Source: calculus Anif.

**Figure 6. Estimation of the contingent liabilities for the health care and pension fund systems in Colombia and the United States (% GDP).**




Source: DNP and calculus by Anif.

## V. Conclusions

The aim of this study was to estimate, preliminarily, the health care sector's contingent liabilities in Colombia. To do so, we initially established that in 2006 the health care sector showed a 2.1% of GDP shortfall. We then created a baseline scenario with a gradual labor informality correction, raising the Contributors/Employed ratio from 40% to 50% over the span of 2006-2050. Despite the advantageous effect this improved ratio would have on total contributions from individuals, the public health care deficit would nevertheless rise to 3.8% of annual GDP in 2035 and then stabilize in the range 1.8% - 2.0% of GDP around 2050.

Then, based on these presumed health care cash flows, we estimated Colombia's health care NPV during the period 2006-2050. Under the baseline scenario, the State's gross obligations due to health care expenditures (equal to public spending) would amount to 110% of GDP in 2007. Once revenues are deducted, the net public duties would be reduced to 97% of GDP (2007). On the other hand, the private sector would show a surplus equivalent to 35% of GDP (2007), as a result of the nature of the insurance business. Thus, when adding together the public sector deficit and the private sector surplus, the health sector's stock NPV would be equivalent to -61.4% of GDP (2007).

Preliminary calculations have shown that the contingent liability of Medicare in the United States, excluding medicines, measures approximately 90% of year 2007 GDP. Including medicines, the liability increases to 259% of GDP. Given the substantial inefficiency that characterizes the health care system in the United States, it seems consistent to think that the contingent liabilities in the USA (including the Medicaid component), surpass those of Colombia. We also believe that our result of a NPV around 97% of GDP (2007) is consistent, for example, with the Colombian pension fund system's liabilities of approximately 160% of GDP.

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