Private health insurance in South Korea:
An international comparison

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Abstract

Objectives: This study is to present the historical and policy background of the expansion of private health insurance in South Korea, and to provide guidance on whether the increased role of private health insurance can counterbalance limited government financing, high out-of-pocket payments, and the persistent financial deficit of South Korea's National Health Insurance (NHI) system. For this purpose, we empirically investigate the experiences of OECD countries on whether and how private health insurance would have impacts on the structure and sustainability of health care financing.

Methods: Using OECD Health Data 2009, we first conduct a comparative study of 30 member countries over the period 1980–2007 to evaluate the shape of the public-private mix of health care financing of South Korea. The panel fixed effects model with the AR(1) error terms are further executed to measure the impacts of private health insurance payment on other sources of health care financing and total health care spending.

Results: Compared to other social insurance systems, social security contributions are relatively limited in Korean health care financing, implying that high out-of-pocket payment may be resolved through the enhancement of the NHI benefit and premium collection. Estimation results show that private health insurance financing is unlikely to reduce government spending on health care and social security contributions. We find evidence that out-of-pocket payments may be alleviated with private health insurance financing. Private health insurance payments, however, are found to have a statistically significant positive association with total spending on health care. This indicates that the duplicated coverage effect may cancel out the potential efficiency gain from the market initiatives.

Conclusions: These findings suggest little evidence for the effectiveness of private initiatives in health care financing in dealing with the fiscal challenges of the South Korean NHI in South Korea. Further studies on the behavioral interplay among public and private insurers, providers and patients in response to a given incentive structure of private-public financing are warranted to formulate the adequate balance between private health insurance and publicly funded universal coverage.

Keywords: Private health insurance; national health insurance; South Korea; health care financing; OECD comparison

JEL classification: I11, H51

1. Introduction

How to balance private-public finances to promote financial sustainability of a health care system has been a major component in many health care reforms. In particular, countries with universal coverage perceive private insurance as a complementary resource to assist public funding [1-5]. Although there is considerable cross-country variation in the way that private health insurance is shaped within the publicly funded system, the rationale of why these countries look for the role of private health care stands firm on the common ground: private health insurance may create market incentives for providers, patients and insurers to be more concerned with cost and quality of care than otherwise [6-9]. On the other hand, it is plausible that private insurance may undermine equity in access to care, which is the essential value of pursed by universal coverage. Thus, countries with universal coverage such as South Korea operate private insurance markets in a heavily regulated fashion. There is, however, no settled evidence to substantiate whether private insurance involvement produces net benefit or loss in terms of quality of care, equity, and cost efficiency [10-11].

This study is to examine the role of private-public mix in health care financing with a special focus on the context of South Korean National Health Insurance (NHI) system. We descriptively compare the structure of health care finance among OECD countries to evaluate the coordination of different funding sources in South Korea. Further we estimate the panel fixed effects model of the impacts of private health insurance financing on three major financing sources (government spending, social security contribution, and out-of-pocket payment), and total expenditure on health care. From these empirical analyses, we aim to draw policy implications on the recent debates on the expansion of private health insurance in South Korea. .

The remaining of this paper is organized as follows: Section 1 presents the historical and policy background of private health insurance in South Korea. Pro- and con- arguments on the expansion of private insurance are discussed. Section 2 describes data, hypotheses and estimation methodology. Section 3 reports empirical findings and Section 4 concludes with suggestions for policy-makers and for further studies.

1.1. Evolution of private health insurance market in South Korea

In the Insurance Business Act, private insurance in South Korea (henceforth, Korea) is categorized into three types: life insurance; nonlife insurance; and insurance for sickness,

accidents and long-term care, so called the Third type. Private “health” insurance refers to the Third type, which broadly covers medical expenses caused by catastrophic illness and accidents (Table 1). Some plans are designed to target income compensation and long-term care costs. Until 2005 products of life insurance companies were restricted to remit lump-sum payment upon the death of the covered person or when she reaches the pre-contracted age. Nonlife insurance companies have offered plans for actual medical expenses since 1963. There were, however, only two types of such products, one for geriatric diseases and the other for women’s diseases. And neither succeeded to mature in the market. Due to the limited managerial capacity for underwriting and premium design, both plans were discontinued by 1979 [12].

Table 1
The Third type private health insurance in Korea

Legal classification	Coverage	Feature
Sickness insurance	Medical expenses Critical illness Income compensation	Complementary payment Fixed-sum payment Group insurance
Long-term care insurance	Long-term care	Fixed-sum payment
Accident insurance	Accidents	Complementary, fixed sum

Source: Cho and Kim [13].

During the 1980s and 1990s, private health insurance products became increasingly popular and diversified in Korea. Cancer insurance was launched in 1981, and plans for prelisted critical illnesses were introduced in 1984. It was in 1988 that the hospital inpatient expense plan began to compensate for the NHI copayments. During the 1990s, private health insurance products further evolved to provide benefit for industrial accidents, dentistry and rehabilitation, and long-term care service, all immensely attracting the general public [13]. Regardless of these dramatic advances in private health insurance, lump-sum payment plans still dominate the entire private health insurance market (89.4% of total private health insurance premium revenue in 2002) [14].

It was the 2002 revision of the Insurance Business Act that entitled life insurance companies to sell medical expenses plan for individuals (effective as of August 30, 2005). These

plans were designated to cover actual medical expenses upon service use rather than to pay a lump sum disbursement upon diagnosis of a listed disease. Since private insurers submit the claimed benefit directly to patients, the benefit payment functions as cash subsidy for self-payments by patients. As a result, private health insurance is perceived to fill up loopholes of the NHI plan [15-18].

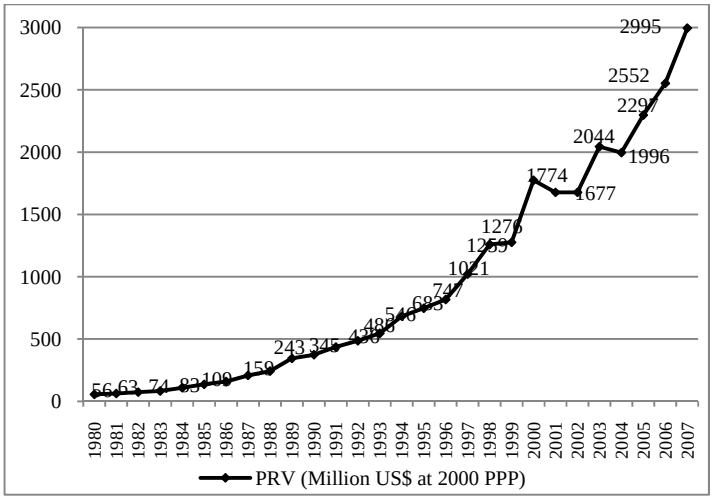
These recent amendments significantly impact the structure of private health insurance market. First, they create severe competition between life insurance and nonlife insurance companies over medical expenses plans: the established, large life insurance corporate (such as Samsung, Kyobo, and Korea Life Insurance) aggressively penetrate the market offering comprehensive "total" plans which combine lump-sum benefit for critical illness, long-term care coverage, life insurance benefits, and medical expenses for outpatient and inpatient services. Second, a new opportunity of playing more influential role in the entire health care system is granted for the private health insurance as it takes care of services excluded from the NHI plan. Lastly, the growth of private health insurance has been remarkable both in enrollment and in payment size since the 1990s. This trend will be further facilitated due to the increasing popularity: people count comprehensive coverage, diverse benefit design, and complementary nature to the NHI plan as reasons to purchase private plans.[1]

Figure 1 shows the exponential growth of private health insurance in Korea over the periods of 1980-2007. The size of private health insurance market is measured by the annual private health insurance financing (PRV) for total expenditure on health care (TEH). In 1980 private health insurance paid US$56 million at the 2000 purchasing power parity (PPP) rate, which is only 0.7% of TEH; by the end of 2007, however, the figure augmented to US$2,995 million at 2000 PPP rate (4.1% of TEH).

Table 2 further suggests the enlarging role of private health insurance relative to the NHI program. Benefit payments made by nonlife medical insurance plans increased from 291.6 billion Korean Won (KRW) in 2001 to 715.9 billion KRW in 2006, and the annual growth

[1] Yun [18] reports the rate of private insurance enrollment of any type as 63.7% (N=406,751). 26.1% (N=106,030) and 62.0% (N=259,222) of the sample is found to hold medical expenses insurance and lump-sum payment plans, respectively, illustrating the prevalence of private health insurance among the NHI members in Korea.

Figure 1
Private health insurance financing in Korea (1980–2007)
(Unit: million US$ at the 2000 PPP rate)



Source: OECD Health Data 2009.

percentage growth rate (20.4% in 2006) was much higher than that of the NHI benefit payment (17.4% in 2006). Accordingly, nonlife insurance benefit payments as a percentage of NHI benefit payments increased from 2.21% in 2001 to 3.32% in 2006. The market size measured by premium revenue also shows the recent expansion of private health insurance (26.9% annual increase in 2006) whereas the premium revenue increase in the NHI plans stays at a relatively moderate rate (11.1% in 2006). Life insurance plans would further magnify the share of private health insurance in the Korean health care market [19].[2]

Although the constant growth of private insurance market is captured both in its annual growth rate and in its ratio to the NHI benefit payment, the major player has still been the NHI plan.[3] Covering more than forty million Korean citizens, total annual NHI benefit payment (21,588 billion KRW) is about thirty times greater than that of comparable private health insurance (715.9 billion KRW) in 2006. As the NHI benefit packages have been progressively

[2] Jung et al. [14] project that total private health insurance premium revenue would be 44.8% of total private spending on health care and 21.4% of total health care spending in 2005.
[3] Cho and Kim [13] report that the private medical expenses insurance payment covers only 2.0% of total medical expenses and 5.6% of total out-of-pocket payments among the NHI patients.

Table 2
Benefits payment and premium revenue by private insurance and NHI plans, 2001–06
(In billions of Korean won)

Year	Nonlife medical expenses insurance			NHI			A/C (%)	B/D (%)
	Benefit payment (A)	Premium revenue (B)	A/B	Benefit payment (C)	Premium revenue (D)	C/D		
2001	291.6	230.2	1.27	13,195.6	8,856.2	1.49	2.21	2.60
2002	349.5 [19.8]	273.6 [18.3]	1.28	13,823.7 [4.76]	10,927.7 [23.4]	1.27	2.53	2.50
2003	465.1 [33.1]	352.3 [28.8]	1.32	14,893.5 [7.74]	13,740.9 [25.7]	1.08	3.12	2.56
2004	485.2 [4.30]	374.2 [6.22]	1.30	16,264.5 [9.21]	15,578.8 [13.4]	1.04	2.98	2.40
2005	594.5 [22.5]	512.8 [37.0]	1.16	18,393.6 [13.1]	16,927.7 [8.66]	1.09	3.23	3.03
2006	715.9 [20.4]	650.8 [26.9]	1.10	21,588.0 [17.4]	18,810.6 [11.1]	1.15	3.32	3.46

Sources: Cho and Kim [13]; Statistical Yearbook 2009, National Health Insurance Corporation (NHIC).
Notes: Annual percentage increase is reported in the bracket. Until 2007 life insurance companies had not launched their own medical expenses plan, which is necessarily more complex than their conventional lump-sum payment product. For this reason, the corresponding figures for life insurance plans are unavailable.

enhanced, the annual growth of the NHI payment is marked at 17.4% in 2006 [20]. [4]

The benefit-revenue ratio in two insurance plans reveals that premium revenue falls short of benefit payment in all years of 2001-2006. In spite of constant growth in premium revenue, private health insurance suffers more seriously than the NHI plan from lack of enough funds for claimed benefit. For instance, the magnitude of revenue shortage in the fiscal year of 2003 was 32% in private health insurance whereas the figure is only 8% in the NHI plan. This indicates that payment control is a difficult task for insurers and private entities are not necessarily more cost effective than the NHI plan in dealing with this issue.

[4] The NHI benefit enhancement raises the NHI benefit rate into 63.6% in 2007. Kim et al. [20] defines the benefit rate as the ratio of total NHI payment to total medical cost for the surveyed individual patients. For the same year, the ratio of public expenditure on health to TEH is reported as 54.9% (Table 5). The discrepancy of these two figures may result from different variable definitions in data sources. The NHI benefit rate captures how much of actual medical bills of patients are paid by the NHI plan based on the 2007 survey on out-of-pocket payments among NHI Patients [20]. This survey collects the medical bills of patients who visited or are discharged from 541 medical providers including hospitals, clinics, dental and oriental medicine clinics, and pharmacies during December 2007. The sample excludes people with no insurance or insured by auto insurance or industrial accident insurance. Also the benefit-in-cash payment is not counted. Further, the benefit payment for plastic surgery, eyesight correction, immunization, implant, dental prosthesis, general health-promoting products such as vitamins and energy drinks are not considered in the benefit rate calculation. On the other hand, the public expenditure and total expenditure on health care available in OECD Health Data 2009 are the national annual statistics which involve all population and all health-related activities - not only medical services for patients, but also prevention, public health promotion, and administration of the NHI program.

1.2. Private health insurance and health care financing in South Korea: 1980-2007

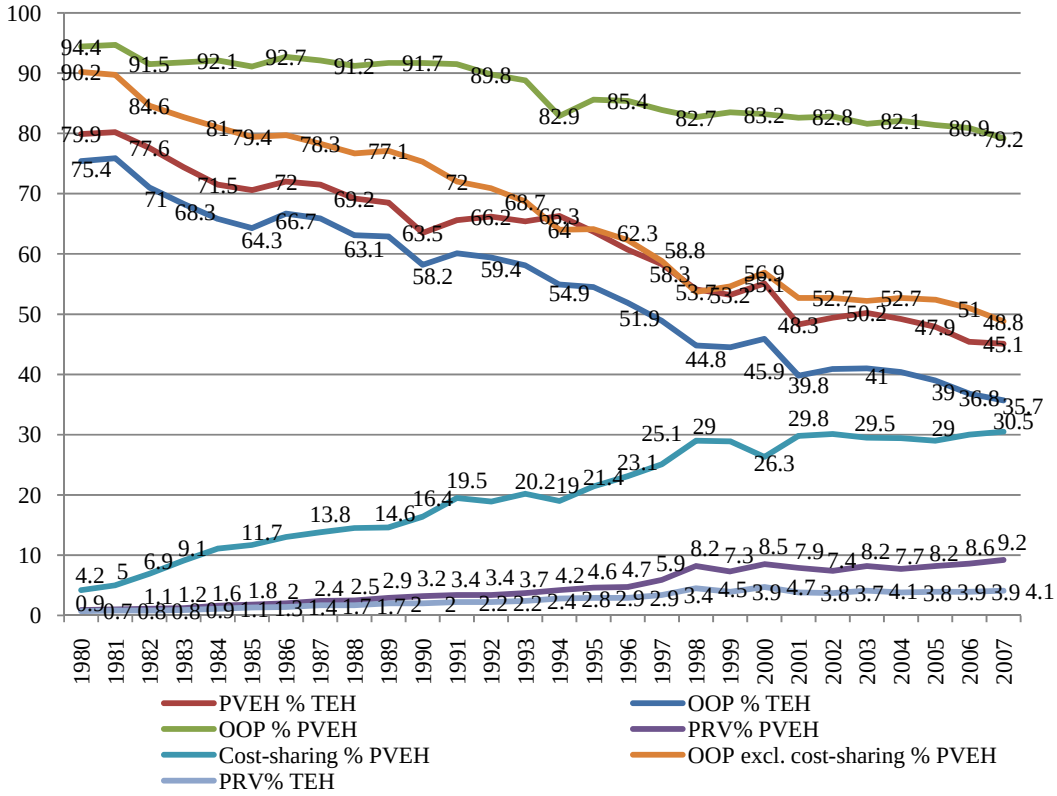
In order to draw implications of the unprecedented growth of private health insurance market in Korea, we assess the structural changes in private-public mix in the Korean health care financing over the period of 1980-2007. Figure 2 hints the basis on which the expansion of private health insurance stands as an aspired policy option to improve financial stability of the Korean NHI system. First, there has been the steady decline but still relatively high private financing in Korea. In 1980, private expenditure on health (PVEH) made up 79.9% of the total THE, showing that before the NHI system was established in 1989, public insurance coverage was nearly ineffectual. The portion of PVEH dropped to 55.1% of TEH in 2000 and continued to decrease thereafter (45.1% in 2007). Although public financing has vastly grown from 20.1% of TEH in 1980 to 54.9% of TEH in 2007, it is still much lower than the average public financing among the OECD countries (72.8% of TEH in 2007).[5] Thus, the government and the NHI insurer are under heavy pressure on taking more responsibility of financing health care.

Secondly, out-of-pocket payment (OOP) has been the primary source of private financing (94.4% in 1980 and 79.2% in 2007). Most of OOP went for the NHI-uncovered services (90.2% of PVEH in 1980), but with the enhancement of the NHI benefit, OOP for uncovered services is reduced to 48.8% of PVEH, which accounts for the remarkable decline in the OOP/TEH ratio (75.4% in 1980 versus 35.7% in 2007) and the PVEH/TEH ratio noted previously. High OOP has invoked the severe public dissatisfaction with the NHI program from the beginning and forced the government to make every effort to expand the NHI benefit package [21-23]. As a result, OOP for the NHI-covered services, that is, cost sharing payment has remarkably amplified from 4.2% of PVEH in 1980 to 30.5% of PVEH in 2007. This partially offsets the large decline of OOP for the NHI-excluded services, leaving the overall reduction in OOP out of PVEH relatively halted (15.2% point versus 39.7% point in OOP/TEH and 34.8% point in OOP/PVEH).

Lastly, private health insurance has been the least employed in the Korean health care. Its increase has been persistent but at a very limited extent (0.9% of PVEH in 1980 and 9.2% of PVEH in 2007). The exponential growth of the private health insurance market since the 1980s shown in Figure 1 seems yet insufficient to declare private health insurance as a reliable financial

[5] The figure is calculated for 27 OECD countries excluding Korea, Belgium, and the Netherlands using OECD Health Data 2009 (Table 5). Relevant statistics are not available for Belgium and the Netherlands.

Figure 2
The sources of financing in South Korean health care, 1980–2007



Source: OECD Health Data 2009.

shield against medical bills in Korea. From another perspective, this offers a great deal of opportunities for private health insurance to develop, particularly when the Korean NHI program faces with the enormous challenge to sustain its fiscal soundness against the demand of the aging and wealthy Korean population [24]. When OOP is already high and the NHI premium rate has been raised to support its benefit expansion in recent years, the Korean government is anxious to delegate the mission to private health insurance.

1.3. The effects of private health insurance on health care financing: debates

Government and public debates over the expansion of private health insurance in the Korean NHI system are ongoing. Limited benefit, insufficient public financing, drastic growth in total health care spending and thus grave deficits in financing altogether push the Korean NHI system to the edge, turning to the role of private health insurance [15, 17, 25].

Advocates argue that private health insurance should be allowed to extensively complement the NHI plan by providing coverage for self-payment. Also private health insurance is expected to promote the responsiveness to consumers and overall efficiency of the Korean NHI system. But, this immediately incites a counterargument that the additional coverage from private health insurance may render people less price sensitive and thus use more services. This would only exacerbate the NHI deficit.[7]

Table 3 outlines the financial vulnerability of the Korean NHI plan. It is obvious that the NHI account balance fell during the 1990s: the annual balance was 268 billion KRW surplus in 1990 but soon plummeted to a deficit of 241 billion KRW in 1997. The 1997 economic crisis and the subsequent macroeconomic restructuring increased the annual deficit from 558 billion KRW in 1998 to 2,177 billion KRW in 2001, which accounted for a 3,637 billion KRW accumulated deficit in 2001. An 18.3% shortage in total revenue relative to total expenditure in the NHI program compelled the government to take immediate action through the 2002 execution of the Special Act of Financial Stabilization of the NHI. This act helped the annual balance bounce back to a 1,494 billion KRW surplus in 2003 by raising NHI contribution rates and injecting a government subsidy (which was fueled by cigarette tax revenues). During 2003-2007, total revenue exceeds total expenditure, transforming the accumulated balance from deficit to surplus. (2636 billion KRW deficit in 2003 to 1160 billion KRW surplus in 2007). But, the gap between total revenue and total expenditure gets narrower (10.7% in 2004 to 0.6% in 2007) and thus the magnitude of annual surplus gradually shrinks from 2079 billion KRW in 2004 to 161 billion KRW in 2007. When the Special Act was designated to expire in 2006 and the participatory government under the leadership of late president Roh Moo-Hyun passionately worked out to achieve an 80% NHI coverage rate by 2010 [27],[8] the financial stability of the Korean NHI system is at an immense risk.

The 1997 economic crisis and the 2002 Special Act uniformly demonstrated that the financial status of the Korean NHI system is intensely subject to various risk factors. First, the

[7] According to Bae et al. [26], the NHI deficit is estimated 32,635 billion KRW by 2015 and 101,425 billion KRW by 2020.

[8] Acknowledging the exclusion of necessary benefits in kind, the Korean government set a procedural plan to extend the NHI benefit package to such items as inpatient meals and therapeutic care for cancer patients as a primary part of the Plan for Advancing the Health Care Industry in 2005. Under the plan, the benefit rate of the Korean NHI was targeted to reach 71.5% by 2008, and 80% by 2010.

inflow of social security contributions is sensitive to macroeconomic shocks. Second, the government subsidy and the increase in NHI premium rates proved to be only short-term remedies to the NHI deficit. Demographic and epidemiological transformations due to population aging necessitate strategies more innovative than the conventional tactics of public financing. In this regard, the expansion of private health insurance plans caught the attention of the government, the insurance companies, and the large private hospitals.

Table 3
Budgetary trends in the Korean National Health Insurance plan
(In billions of Korean won, 1990–2007)

Year	1990	1995	1996	1997	1998	1999	2000
Revenue (A)	2,432	5,614	6,631	7,554	8,230	8,892	9,828
Premium contributions	1,884	3,601	4,175	4,879	5,255	6,306	7,229
Expenditure (B)	2,164	5,076	6,464	7,766	8,775	9,585	10,744
Annual balance	268	538	167	-241	-558	-718	-916
B/A (%)	89.0	90.4	97.5	103.2	106.8	108.1	109.3
Accumul. balance[a]	268	806	973	732	174	-544	-1,460
	2001	2002	2003	2004	2005	2006	2007
Revenue (A)	11,928	14,305	17467	19,408	21,091	23,263	26,050
Premium contributions	8,856	10,928	13741	15,579	16,928	18,811	21,729
Expenditure (B)	14,106	14,798	15972	17,330	19,980	22,818	25,889
Annual balance	-2,177	-493	1,494	2,079	1,111	445	161
B/A (%)	118.3	103.4	91.4	89.3	94.7	98.1	99.4
Accumul. balance	-3,637	-4,130	2,636	-557	554	999	1,160

Source: Statistical Yearbook, National Health Insurance Corporation, 1991–2008.
Note: [a] Calculated by the cumulative sum of A − B since 1990; data before 1990 are not available.

To substantiate controversies on the expansion of private health insurance, this study focuses on how it would alter the entire shape of health care financing structure. We rely on the experiences of the OECD countries in a journey to find empirical evidence of the following hypotheses: whether private payers reduce the burden of public financing, either (1) government spending or (2) social security contributions; whether private health insurance may help (3) counterbalance individuals' self-payment; and lastly, whether it may (4) contribute to cost containment by promoting efficiency in health care management and delivery.

2. Methods

Using data from OECD Health Data 2009, we first conduct the descriptive international comparison of thirty member countries based on the latest aggregate statistics of health care financing composition. In this comparison, we investigate whether public financing in Korea has any capacity to raise its contribution to the NHI budget before seeking for the expanded role of private health insurance.

Next, we estimate panel fixed effects models where each outcome variable is specified as a linear function of private health insurance payment [28-30].[9] For the periods of 1980–2007, we examine the contemporary and lagged effect of private health insurance payments on the outcome variables of our interest. The regression equation for the relationship between PRV and the government spending on health care is framed as follows:

$$\log(gov\_hc)_{it} = \alpha + \beta \log(prv)_{it-j} + \gamma_1 \log(teh)_{it} + \gamma_2 \log(gdp)_{it} + \gamma_3 \log(gov\_other)_{it} + \delta_t + u_{it},$$

where gov_hc_{it} is the total government outlay on health care for country *i* at year *t*. We also consider the relationship between j^{th} lags of private health insurance financing (*prv*) and the government spending on health care, respectively for j =0, 1, 2. By doing so, we try to capture the possible delayed impact of the previous changes in *prv* on the current *gov_hc*. We control for country-specific aggregate economic conditions which may determine the size of *gov_hc* by including total health care expenditure (*teh*) and GDP (*gdp*) variables in the equation. *gov_other* is total government spending on items other than health care, which is included to control for the effect of the government's overall enlarged financial capacity to invest more in health care. The time-specific shocks δ_t that might affect the key relationships under study are taken into consideration by year dummies. All variables are measured as the logarithm of level amount at a U.S. dollar unit at purchasing power parity (PPP).

Similarly, we model the equation for the hypothesis (2) on the association between PRV and SSC as follows:

$$\log(ssc)_{it} = \alpha + \beta \log(prv)_{it-j} + \gamma_1 \log(teh)_{it} + \gamma_2 \log(gdp)_{it} + \gamma_3 \log(gov\_other)_{it} + \delta_t + u_{it}.$$

[9] The focus of Tuhoy et al. [28] was on the role of total private spending whereas our analysis looks at the role of private health insurance payments. Hence, the regression equations are modified accordingly.

To verify the hypothesis (3) on the relationship between PRV and OOP, we set up the following regression equation where total public spending on health care (*pub*) is controlled for:

$$\log(oop)_{it} = \alpha + \beta \log(prv)_{it-j} + \gamma_1 \log(pub)_{it} + \gamma_2 \log(teh)_{it} + \gamma_3 \log(gdp)_{it} + \delta_t + u_{it}.$$

Finally, the hypothesis (4) for cost saving effect of private health insurance is tested by the following model:

$$\log(teh)_{it} = \alpha + \beta(r\_prv)_{it-j} + \gamma_1 \log(gdp)_{it} + \gamma_2 \log(pop)_{it} + \gamma_3 (r\_pub)_{it} + \gamma_4 (r\_elderly)_{it} + \gamma_5 le_{it} + \gamma_6 (n\_doct)_{it} + \gamma_7 (r\_inpat)_{it} + \delta_t + u_{it},$$

where $j = 0, 1, 2$. To avoid the endogeneity problem rising from the fact that PRV is a component of TEH by health accounting definition, we measure the impact of private health insurance using the ratio of PRV to THE, *r_prv*.

In the line with Gerdtham et al. [29] and Tchoe and Nam [30], we speculate that total health care expenditure is determined by socioeconomic and health-related factors. In our model, aggregate socioeconomic factors are the logarithms of the national per capita income (GDP), total population in thousand (POP), and the percentage of persons aged 65 or more out of the total population (*r_elderly*). Health-related factors are the ratio of public financing to total health care spending as percentage (*r_pub*), life expectancy at birth (*le*), the number of practicing physicians per 1,000 persons (*n_doct*), and inpatient costs as the percentage of total expenditure on health care (*r_inpat*). Summary statistics of variables used in theses estimations are presented in Table 4.

Empirical complexity rises with the error terms, u_{it}. It is possible that this idiosyncratic unobserved error term is subject to within-country serial correlation due to the shared time trends between outcome variables and control variables. To incorporate the autocorrelation issue, we impose the stationary AR(1) process for u_{it} . Further, it is highly plausible that u_{it} contains the country-specific heterogeneity which may cause the endogeneity bias in the estimates unless u_{it} is uncorrelated with all of control variables. We assume the country-specific heterogeneity is constant over time and denote it as u_i . The error process is then written as follows:

$$u_{it} = u_i + e_{it},$$

where $e_{it} = \rho e_{it-1} + \varepsilon_{it}, \varepsilon_{it} \sim i.i.d.$

We conduct the F-test for the null hypothesis that all u_i is zero. By applying the panel fixed effects model, our esitimates are robust to the endogeneity bias even when there exists the correlation between the regressors and u_i.

Table 4. Summary Statistics

Variables	Mean	Standard Deviation	
Log(GOV_HC)	8.74	Overall Between Within	1.82 1.70 .535
Log(SSC)	8.48	Overall Between Within	2.28 2.15 .513
Log(OOP)	8.17	Overall Between Within	1.91 1.70 .513
Log(TEH)	9.80	Overall Between Within	1.64 1.54 .553
Log(PRV)	6.96	Overall Between Within	2.30 2.21 .821
Log(GDP)	12.4	Overall Between Within	1.53 1.46 .449
Log(GOV_OTHER)	11.8	Overall Between Within	1.44 1.42 .355
Log(POP)	9.57	Overall Between Within	1.52 1.55 .069
Public health care spending (%TEH)	72.4	Overall Between Within	14.7 14.0 4.68
Persons aged 65 or more (%POP)	13.0	Overall Between Within	3.44 3.22 1.34
Life expectancy at birth (in years)	75.8	Overall Between Within	3.50 2.88 2.01
Physicians per 1,000 persons	2.53	Overall Between Within	.811 .709 .402
Inpatient costs (%TEH)	40.1	Overall Between Within	11.1 9.67 6.81

Notes: Mean values are obtained as pooled average across all years. Between and within standard deviations represent standardized variations in values over years and across countries, respectively. There are missing values for certain time points in a given country. It is partially because the ratification of OECD membership is signed later than 1980 for some countries (1995 for Czech Republic, 1996 for Hungary and Korea, 1994 for Mexico, 1996 for Poland, and 2000 Slovak Republic) and also because national health accounts are often not available in the earlier years of the study period. Also, we have four countries with zero premium financing (Australia, Denmark, Sweden, and United Kingdom), of which log(SSC) values are missing for all time periods.

3. Findings

3.1. Descriptive Analysis

As noted in Table 3, the primary sources of NHI revenue are premium contributions collected from all NHI members based on their income. Premium contributions (1,884 billion KRW) composed 77.5% of total NHI revenue (2,432 billion KRW) in 1990, and persistently increased over the study period to 83.4% (21,729 billion KRW out of 26,050 billion KRW) in 2007. Since the NHI enrollees pay a substantial portion of medical bills as OOP (35.7% of TEH in 2007) in addition to the NHI premium, the NHI insurer may run into political tension on further increase in the NHI premium rates.

The comparison with the OECD countries provides further insight about whether SSC in Korea is already too high or still has a room to grow. In Table 5, the SSC in Korea is responsible for 42.7% of TEH whereas the OECD average is 32.4%. We measure the relative weight between GOV and SSC within public financing, which is 0.22 versus 0.78 in Korea, while the OECD average is 0.55 versus 0.45. Due to limited government spending on health care (12.3% of TEH), Korea holds the third lowest ratio of PUB to TEH (54.9%) among OECD countries.[10] This seems to imply that more public input is possible in Korea through greater government outlay rather than higher SSC.

One caveat should be noted in the above implication: the disparity in the health care systems across the OECD countries. Some countries run tax-based universal coverage systems - Canada, Italy, and the United Kingdom - where the primary source of health care financing is by nature government spending (68.6%, 76.4%, and 81.7%, respectively), with no or little contribution from premiums. Unless the Korean government considers transforming the NHI system into a tax-financed system, Korea should be compared with countries of a similar

[10] 45.2% in Mexico and 45.4% in the United States. The OECD average share of PUB in TEH is 72.8%.

premium-based social insurance system, such as France, Germany, and Japan, where the government share in health care financing is not surprisingly moderate (5.2%, 9.0%, and 15.4%, respectively). Accordingly, we limit the comparison group to countries with more than a 12.7% rate of SSC to TEH. The "12.7% threshold" is identified by the SSC/TEH ratio in the U.S. As the health insurance in the United States is primarily operated by private entities, we consider the U.S. share of social security contributions as the minimum level of premium financing for any social insurance system. By applying this "12.7% threshold," we exclude 12 countries from the comparison group.[11]

This modified comparison shows that the share of government funding in Korea is indeed low relative to other OECD countries (on average, 20.2% of THE). However, the gap is narrowed down to 8.1% points from the original 28.1% points. The rate of SSC to TEH in Korea is now found *less* than the adjusted OECD average (51.5%) by 8.8% points. And the composition of public financing (PUB) in Korea is fairly similar to that of the adjusted comparison group (0.28 to 0.72). These findings suggest that both government spending and premium financing have rooms to grow in Korea. Thus, neither excessive SSC nor GOV can be the legitimate basis to summon the help of private health insurance financing. The question of whether private health insurance ought to be expanded, then, would be in fact the question on how willingly the Korean government and the NHIC would take extra responsibility of supporting health care.

A second, equally controversial question is whether private health insurance would alleviate public financing. Colombo and Tapay [11] conclude that the potential of cost shifting from public financing to private health insurance is present to a limited extent. This is because the complementary coverage by private health insurance plans will allow enrollees to use more services than otherwise, resulting to higher total medical costs. Also, the bargaining power of a single private insurer over service prices and practices of providers may be limited compared with the single payer. When these features of private health insurance result to greater overall health costs, public insurers would not experience much benefit of cost shifting to private insurers.

High out-of-pocket spending in Korea is another obvious fact observed in Table 5. Total OOP spending is 35.7% of TEH in Korea, substantially higher than the OECD average of 18.3%

[11] The twelve excluded countries are Australia, Canada, Denmark, Ireland, Italy, New Zealand, Norway, Portugal, Spain, Sweden, the United Kingdom, and the United States.

Table 5
Health care financing structure

	Sources of financing (% of TEH)					
	Public			Private		
	Total	Government	Social security	Total	OOP	Private insurance
Australia	67.7	67.7	0.0	32.3	18.2	7.5
Austria*	76.4	31.6	44.8	23.6	15.4	4.6
Belgium	–	11.9	60.4	–	18.3	5.4
Canada	70.0	68.6	1.4	30.0	14.9	12.8
Czech Republic	85.2	8.3	76.9	14.8	13.2	0.2
Denmark	84.5	80.2	0.0	15.5	13.8	1.6
Finland	74.6	60.1	14.5	25.4	18.9	2.1
France	79.0	5.2	73.8	21.0	6.8	13.4
Germany	76.9	9.0	67.8	23.1	13.1	9.3
Greece	60.3	29.1	31.2	39.7	–	–
Hungary	70.6	12.4	58.2	29.4	24.9	1.1
Iceland	82.5	55.5	27.0	17.5	16.0	0.0
Ireland	80.7	80.1	0.6	19.3	9.9	8.1
Italy	76.5	76.4	0.1	23.5	20.2	0.9
Japan*	81.3	15.4	64.0	18.7	15.1	2.6
Korea	**54.9**	**12.3**	**42.7**	**45.1**	**35.7**	**4.1**
Luxembourg*	90.9	20.6	70.3	9.1	6.5	1.7
Mexico	45.2	18.2	26.6	54.8	51.1	3.7
Netherlands	–	5.3	69.5	–	5.5	5.7
New Zealand	–	68.2	11.9	–	14.0	5.0
Norway	84.1	72.1	12.0	15.9	15.1	–
Poland	70.8	12.3	58.6	29.1	24.3	0.5
Portugal*	71.5	70.7	0.8	28.5	22.9	4.1
Slovak Republic	66.8	6.8	60.1	33.2	26.2	–
Spain	71.8	66.7	5.1	28.2	21.1	5.9
Sweden	81.7	81.7	0.0	18.3	15.9	0.2
Switzerland	59.3	16.5	42.8	40.7	30.6	9.2
Turkey+	71.4	33.7	37.7	28.6	19.9	–
United Kingdom	81.7	81.7	0.0	18.3	11.4	1.1
United States	45.4	32.7	12.7	54.6	12.2	35.2
Average	**72.8**	**40.4 (20.2[§])**	**32.4 (51.5[§])**	**27.3**	**18.3**	**5.6**

Source: OECD Health Data 2009.
Notes: * Data in 2006. + Data in 2005. All other data are reported for 2007. The average values are obtained excluding countries with the pertinent information omitted. [§] It is computed for countries where the rate of social security contributions out of TEH exceeds the U.S. level of 12.7%. Figures may not add up 100% because of rounding and excluded minor funding sources such as corporate payment.

and figures for countries with similar social insurance system (13.1% in Germany, 15.1% in Japan). It is interesting that social security contributions and OOP, if summed up, account for a similar portion of TEH across Germany (80.9%), Japan (79.1%), and Korea (78.4%). Considering the relatively high proportion of social security contributions to TEH in Germany (67.8%) and Japan (64.0%) compared with Korea (42.7%), low OOP in Germany and Japan is likely to be the consequence of high social security payments. These observations together form an indication that the generous social insurance benefit and low OOP are the outcomes achieved through the support of social security contributions. This principle, if politically feasible, may be equally solid for Korea. This internalization of OOP payments into the NHI system, however, may spur another debate on how much of income redistribution through the NHI scheme the Korean general public is willing to approve. Germany and Japan appear to weave the value of collective risk-sharing into their social insurance scheme more seriously than Korea does.

In short, it is incontestable that the NHI benefit enhancement and the reduction of OOP should be the most essential goals of the Korean health care reforms. Whether the expansion of private insurance is *the* solution is yet controversial because it is an empirically daunting task to separately quantify two offsetting effects on private health insurance on total health care: more spending due to the additional coverage and less spending due to market initiatives for the efficient delivery and management of health care. From a policy perspective, however, it is still informative to estimate the overall effect of private health insurance on cost saving since the enhanced role of private health insurance would be desirable only when the efficiency benefit exceeds the coverage effect on total health care spending.

3.2.Estimation Results

Table 6 presents the results from the panel fixed effects estimation for the hypothesis (1) , showing no statistically significant association between private health insurance payments (PRV) and government spending on health care(GOV_HC). This implies that the reduction of the governmental fiscal burden may not result from the expansion of private health insurance. The 1% increase in total spending on health care is found to raise the government spending on health care by the scale of 1.35 to 1.49%, suggesting that the a modest increase in total health expenditure can be alarming to the government budgetary balance. When these coefficients are applied to the

case of Korea in 2007, the additional US$10 million total spending on health care is found to yield to the increase in government spending by US$1.66 to1.83 million.[13]

Table 6
Private health insurance and government spending on health care

Variables	Log of GOV_HC					
	Coeff.	SE	Coeff.	SE	Coeff.	SE
log(PRV)	-.027	.027	-	-	-	-
$\log(PRV)_{-1}$	-	-	-.027	.021	-	-
$\log(PRV)_{-2}$	-	-	-	-	.026	.022
Log(TEH)	1.35*	.164	1.47*	.135	1.49*	.128
Log(GDP)	-.264	.210	.008	.188	-.016	.178
Log(GOV_OTHER)	-.091	.129	-.088	.108	-.164	.103
R-squared	.8397		.791		.815	
F-test (H_0: all $u_i = 0$)	123.8		99.4		101.33	
The number of groups	25		25		25	
N	377		356		338	

Source: OECD Health Data 2009.
*Note*s: The time period studied is 1980–2007. Time-specific effects are controlled for by year dummies. * indicates the 1% statistical significance.

Results in Table 7 also provide little evidence for hypothesis (2) on the negative association between private health insurance and social security contributions (SSC). It suggests that paying additional premium for private health insurance plans would not save the premium payment for the NHI program in Korea. Unlike the case of government spending, total health spending has less than a unit percentage effect on the social security premium (.717~.771), indicating that SSC is less responsive than government spending to the increase in total health expenditure. In brief, findings in Tables 6 and 7 suggest that the expansion of private health insurance may not necessarily lower the burden of public financing for health care in Korea.

In Table 8, the estimated relationship between private health insurance (PRI) payment and OOP is reported. It is noted that there exists the statistically significantly negative association between PRV and OOP: the 1% increase in PRV yields to .065% reduction in OOP, which corresponds to US$19.0 million savings in OOP with the additional US$33.8 million

[13] Total health care spending is US$81,806 million and government spending on health care is US$10,042 million in Korea at the year 2007. All information is drawn from OECD Health Data 2009. All figures are measured at the US$ purchasing power parity unit.

Table 7
Private health insurance and social security contributions

Variables	Log of SSC					
	Coeff.	SE	Coeff.	SE	Coeff.	SE
log(PRV)	-.023	.047	-	-	-	-
$\log(PRV)_{-1}$	-	-	.010	.047	-	-
$\log(PRV)_{-2}$	-	-	-	-	.0005	.053
Log(TEH)	.771**	.276	.717*	.292	.739*	.302
Log(GDP)	.055	.386	-.135	.402	-.137	.434
Log(GOV_OTHER)	.483*	.221	.504*	.228	.540*	.239
R-squared	.811		.464		.559	
F-test (H_0: all $u_i = 0$)	142.5		148.8		152.6	
The number of groups	21		21		21	
N	273		257		242	

Source: OECD Health Data 2009.
Notes: The time period studied is 1980–2007. Time-specific effects are controlled for by year dummies. * and ** indicates the 5% and 1% statistical significance, respectively.

payment by private health insurance (Korea in 2007).[14] If we apply the average benefit to premium revenue ratio of private health insurance (1.24 in Table 2), the US$33.8 million payment accompanies the US$27.3 million premium revenue, which is to be financed by the enrolled individuals. In sum, premium increase in private health insurance exceeds savings in OOP by US$8.3 million. At the individual level, it is simply a negative sum cost shifting from OOP to private health insurance. At the society level, this cost shifting enhances the collective risk pooling. Whether individuals have a will or an obligation to pay out of their own resources for this societal value is another question of political and philosophical importance.

With the 1% additional public spending on health care, OOP may be reduced by the magnitude of the 1.19~1.24%. A unit percentage increase in total health care spending, however, inflates OOP by the scale of 1.85~2.04%, indicating that OOP is much more vulnerable than GOV and SSC to total health care spending blast. If public spending adjustment were not carried out in a timely manner to catch up with total health spending acceleration, it is the patients who shall end up with the vast financial liability for their medical bills.

[14] According to OECD Health Data 2009, total out-of-pocket payment is US$29,201 million and total private insurance payment is US$3,377 million in Korea at the year 2007. All figures are of the US$ purchasing power parity unit.

Table 8
Private health insurance and out-of-pocket payments

Variables	Log of OOP					
	Coeff.	SE	Coeff.	SE	Coeff.	SE
log(PRV)	-.065**	.015	-	-	-	-
$\log(PRV)_{-1}$	-	-	-.010	.015	-	-
$\log(PRV)_{-2}$	-	-	-	-	-.007	.015
Log(PUB)	-1.24**	.097	-1.19**	.100	-1.23**	.104
Log(TEH)	2.04**	.138	1.85**	.135	1.92**	.142
Log(GDP)	.160	.110	.223*	.107	.173	.114
R-squared	.903		.859		.840	
F-test (H_0: all $u_i = 0$)	7.73		10.6		10.4	
The number of groups	25		25		25	
N	395		368		349	

Source: OECD Health Data 2009.
Notes: The time period studied is 1980–2007. Time-specific effects are controlled for by year dummies. * and ** indicates the 5% and 1% statistical significance, respectively.

Finally, Table 9 illustrates the estimation results on the effect of PRV on total spending on health care. We find a statistically significantly positive effect of private health insurance financing on total health care spending. If the ratio of PRV to TEH rises by 0.1, it leads to .0634% increase in the TEH, which is tantamount to US$51.9 million in Korea. This result demonstrates that notwithstanding the potential efficiency benefit of private health insurance involvement, the increased engagement of private health insurance in health care financing may be related with higher total spending on health care. To produce the efficiency gain, private health insurance needs to be sufficiently intrusive in providers' practice in delivery and management. Unless private health insurers are able to integrate providers as well as enrollees into a cost-sensitive practice,[15] the mere expansion of private insurance payment in Korea may not be an asset to the NHI system.

[15] Unlike in the U.S., private health insurance in Korea has no delegation to negotiate with providers over service pricing and delivery practice. These tasks solely belong to the NHIC. Private insurers simply pay the claimed benefit directly to patients. Because of this, the idea of expanding private health insurance not only implies more number of products and enrollees, but also fundamental restructuring of the way that the entire health care system in Korea is operated.

Table 9
Private health insurance and total spending on health care

Variables	Log of TEH					
	Coeff.	SE	Coeff.	SE	Coeff.	SE.
PRV/TEH	.634*	.382	-	-	-	-
PRV/TEH_{-1}	-	-	.130	.337	-	-
PRV/TEH_{-2}	-	-	-	-	-.199	.302
Log(GDP)	.810***	.102	.705***	.108	.714***	.089
Log(POP)	.345***	.118	1.26***	.199	.418***	.128
PUB/TEH (%)	.005***	.002	.005***	.001	.007***	.001
Persons aged 65+ (%POP)	.001	.014	-.022	.014	.003	.011
Life expectancy at birth (in years)	.033***	.011	.027**	.012	.031***	.011
Physicians per 1,000	.009	.026	.007	.026	.005	.024
Inpatient costs (%TEH)	-.003**	.001	-.002**	.001	-.003**	.001
R-squared	.987		.984		.994	
F-test (H_0: all $u_i = 0$)	3.61		5.71		11.8	
The number of groups	23		23		23	
N	282		265		248	

Source: OECD Health Data 2009.
Notes: The time period studied is 1980–2007. Time-specific effects are controlled for by year dummies. *, **, and *** indicate the 1%, 5% and 10% statistical significance, respectively. Results remain intact even when the estimation is replicated, excluding the United States.

4. Discussion

In this study, we empirically examine the validity of arguments on the expansion of private health insurance in the Korean NHI system. Hypothetically, the expansion of private insurance may provide various benefits to the public insurer and the general population. The insufficient ranges of benefit coverage, high portion of out-of-pocket payments, and fiscal challenges of the Korean NHI plan seem reasonable bases to favor supplementary private plans. This study, however, finds limited evidence for this belief. Our descriptive and multivariate panel analyses of OECD Health Data 2009 indicate that private insurance payments do not necessarily lower government financing and the NHI premiums. Although a part of out-of-pocket payments may be passed on to private insurers, the magnitude of savings in OOP is projected less than the additional private health insurance premium contribution. Total health care spending is found to

be positively correlated with private health insurance financing. This finding seems to have strong support from the literature on moral hazard problem of dual coverage [31].

There are several aspects of private health insurance that this study is unable to fully address. First, there are other possible benefits than health cost containment of the expansion of private insurance plans, such as the individual satisfaction from diverse plan choices, lower premiums due to market competition among private insurers, and advances in medical technology initiated by private entities. The marketing strategies of private insurers and their complex plan designs, however, may confuse consumers so they prefer adhering to their present plan even when there is a superior alternative. Information asymmetry between consumers and insurers may hinder the consumer benefit from greater private insurance.

Secondly, there is the equity effect of private health insurance. Risk selection based on health status and limited access to private health insurance by affordability may be only part of inequity associated with private health insurance. Selective access to high quality providers and financial disparity among providers are also possible. Efficiency gain from the private health insurance involvement, thus, may be discounted by damage in equity [32-34].

Thirdly, private health insurance may change behaviors of participants in health care markets, not only the NHI insurer but also patients, physicians, and hospitals. Thus, the expansion of the private insurance needs to be reviewed not only from the financing perspective but alto from the entire features of health care system including reimbursement, delivery process, and health outcomes.

Methodology wise, this study is subject to a few limitations. As noted in Melberg [35], there are the general limitations associated with using OECD data for international comparison such as different health accounting methods across countries and the sensitivity to currency conversion unit. Also the private health insurance products, industrial structures, and surrounding conditions of health care systems are immensely diverse across countries. Thus, the exact dynamics of different financing sources in a given country may vary from what this study projects. The causal relationship between private health insurance financing and other components of the entire health care system may warrant further studies. Definitive policy suggestions on the optimal private-public interplay in health care financing certainly require meticulous inspection on detailed characteristics of private health insurance and health care system of a country. Nonetheless, findings of this study can be a good advice to the Korean

health care reform, saying that the expansion of private health insurance within the NHI system should be approached with evidence and due caution.

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