A Macroeconomic View of Cost Containment:

Simulation Experiments for Thailand

Chalermpol Chamchan

Guy Carrin

Abstract

Cost-containment is distinctively relevant across countries regarding the contexts of health systems and the macro-economy. Not only about the limiting or the reducing of health expenditure, but more significantly about the right amount that countries ought to spend and what they can afford in a sustainable way. Using a simulation model and the consolidated account approach to analyse Thailand’s health financing system, this paper probes forecasted changes in health expenditure, and financing feasibility under a number of alternative scenarios. With demands for better quality of health care and service, expanding national health expenditure, especially of the public sector, is found to be an essential key factor for Thailand. To balance the consolidated account, especially in the case of deficits, three key variables can be simultaneously considered – the government subsidies, the co-payments of the 30 Baht Scheme and the contribution rate of the Social Security Scheme (SSS). Nevertheless, like other middle-income countries, the Thai government’s capacity to subsidize the health system is constrained by the

1 The paper was originally co-written during the 2-month internship from December 2004 to January 2005 at Health Financing Policy unit (HFP), World Health Organization (WHO/HQ) with Dr. Guy Carrin. Preliminary findings were presented at the ‘International Conference on Cost Containment in National Health Insurance System’ organized by the National Health Security Office (NHSO) of Thailand, in February 2005 by Dr. Carrin in complement with the presentation on ‘Cost Containment Issues in Health Financing: Lessons from international experience’. Updates of the simulation with the data of year 2004 are proceeded in June 2005.
public finance situation; as a matter of fact tax incomes are limited and closely dependent on the macro-economic conditions. In regard to the simulation experiments, efficient management of the Civil Servant Medical Benefit Scheme (CSMBS) and the SSS with cost containment practices are a possible alternative, as well as finer compliance by the private workers with the SSS, in financing the consolidated account to cope with the deficits under the situation when government subsidies are limited or under-financed.

Key words: Cost containment, health financing, public health system, Thailand

1. Introduction

Cost containment is not just about limiting or reducing health expenditure. It is rather related to the question of what is the right amount that countries ought to spend on health and what they can afford in a sustainable way. Countries also find themselves in different situations. Low-income developing countries, for example, may even need to spend a higher amount of resources, usually via a combination of domestic and external resources. On the other hand, high-income countries were already confronted with the question of cost-containment some three or four decades ago, when health expenditure started to grow much faster than their Gross Domestic Product (GDP). Currently these countries need to constantly assess appropriate cost containment measures in the face of phenomena such as increased population aging and the availability of new health care technologies. In between, we have middle-income countries, such as Thailand, that are engaged in reforming their health financing system and are facing the question of how best to contain costs, while improving the funding for health services.

One can look at the issue of cost containment from two angles. One is the health system perspective, whereby cost containment policies focus on monetary and non-monetary incentives to impact on the supply and demand of health services. Provider payment methods, for example, are important to influence the supply, whereas patient charges are one method to influence demand\(^2\). The other perspective is that of cost containment within the context of the macro-

\(^2\) See Carrin and Hanvoravongchai (2003) for an assessment of provider payments and patient charges as policy tools for cost-containment in high-income countries.
economy. From this perspective, one seek to clarify the availability of the financial resources for health at the national level, taking account of constraints that are the result of the structure and evolution of the macro-economy, including important sectors such as public finance.

In this paper, we adopt the second perspective. We use a simulation model to address the issue of cost containment in the Thai health financing system. The main components of the simulation model “SimIns” are presented in the next section. Then in section 3, we examine a number of alternative scenarios, by paying special attention to forecasted changes in health expenditure and the feasibility of financing those changes. These changes are the result of comparing the alternative scenarios with a so-called baseline solution that is presented in section 3.1. An important characteristic of these analyses is that a consolidated approach is taken towards the revenue and expenditure of the three sub-schemes that make up Thailand’s health financing system. Concluding remarks are presented in section 4.

2. Overview of the main components of the simulation model

The simulation tool used is called SimIns\(^3\). It analyses the basic mechanisms of health financing, including health insurance, at country level and projects the development of revenue and expenditure for the health sector under certain assumptions over a 10 year period. Key variables in the simulation model - population coverage, incomes, health insurance contributions, co-payments, health care costs and utilisation rates - are varied according to six population groups and up to fifteen health service categories. If several sub-health financing systems exist, including health insurance and tax-financed health services, SimIns ensures that the appropriate linkages are made across these sub-systems. One of its principal uses is to illustrate the implications of initial policies with respect to key health financing variables (on both the revenue and expenditure side), thus reflecting (as opposed to setting) different policy options. Another major use is to help the analyst determine what sets of contributions and/or utilisation patterns and/or health care costs can ensure financial equilibrium in a dynamic, changing environment. Summarized, it is a

\(^3\) The Excel-based version 2.0 of SimIns has been used for the analyses in this paper. Note that the database-version 1.0 concentrates on health insurance financing only; see Carrin and James (2004).
simulation and calculation tool that provides assistance in understanding the implications of policy decisions and helps in the design of alternative financing policies, ensuring a coherent set of results given the user’s inputs.

The following diagram illustrates the basic structure of SimIns. On the right hand side of Figure 1, health expenditure incurred by the population that is covered by the health financing system is based on cost estimates (for different health service categories) multiplied by associated utilization rates. Co-payments to be paid directly by the covered population as well as administrative costs obviously impact upon the health expenditure that is to be financed ultimately by the health financing system. On the left hand side of Figure 1, one finds that financing of health expenditure is via health insurance contributions and government subsidies. One observes the role played by the GDP and other macroeconomic conditions (such as inflation), i.e. how they are linked to the total government budget and the subsequent allocation to health, and to wages and other incomes that constitute the basis for health insurance contributions. (Here: Figure 1. Basic linkages of health insurance account in the simulation model)

3. Cost containment scenarios: the case of Thailand

An important step in analysing cost containment policies is to build a “baseline” simulation. It is essentially a simulation whereby all variables in the model follow a so-called normal course. In other words, in the baseline simulation, no special cost containment policies are introduced. Subsequently, cost containment policies can be simulated, introducing alternative sets of values for those variables that could be subject to policy changes. The policy responses to a particular policy are then studied by comparing the baseline and policy simulations.

3.1 Towards the construction of the baseline simulation

3.1.1 Information from the 3 sub-health financing schemes

After the implementation of universal coverage with the introduction of a new health financing scheme the so-called “30 Baht treating all diseases” or casually the “30 Baht Scheme” in 2001, Thailand’s public health security presently consists of three major health and welfare schemes:
1) The Civil Servant Medical Benefit Scheme (CSMBS) is a package of welfare and health care benefits for active and retired government employees and public sector workers, as well as their dependents including spouse, parents and children. In 2004, regarding the Health and Welfare Survey (HWS2004) report, the number of government and public sector workers is reported at 2.86 million, estimated to be 6.5 million\(^4\) or 10.0 percent of total population including their dependents.

The CSMBS is totally financed via general taxes. Expenditure per beneficiary is estimated to be as high as 3,800 baht\(^5\). The rapid escalation of health expenditure is the result of problems with cost-containment, especially incentives for providers to over-prescribe due to the use of the “fee for service” payment method. However, a first step in cost containment was taken in April 2002 with the introduction of the Diagnosis Related Groups (DRGs) system within a global budget for the payment of inpatient services. The system was, nevertheless, revoked after four months due to the proof of objection to the enactment of the CSMBS’s financing\(^6\).

2) The Social Security Scheme (SSS) provides social health insurance benefits and is compulsory for employees in private enterprises with more than one worker\(^7\). However, compliance with it is not yet complete. In 2004, the number of workers covered stands at around 7.83 million\(^8\), out of 14.71 million workers in the private sector, representing about 11 to 12 percent of the total population. The Social Security Office (SSO) manages the SSS. Contributions into the SSS fund are from three parties: employee, employer and the government each contributed 1 percent of the employee's salary during the period 1998-2003\(^9\) but 1.5 percent\(^10\) each

\(^1\) Anyway, the number was estimated to be between 6 and 7.4 millions in 2003 by Chowdhury J. A. (2004).
\(^2\) Na Ranong V. et al. (2002).
\(^3\) สรณสถาพร (2004).
\(^4\) In 1991, the requirement was brought to enterprises with more than ten workers, which later on adjusted to enterprises with more than one worker in 2002.
\(^6\) Up to 1997 before the financial crisis, the rate was once at 1.5 percent.
\(^7\) The contributions are collected as for the first 4 types of benefits by the SSS including sickness, maternity, death and invalidity.
from 2004 on. Providers those have a contract with the SSO are paid on a capitation basis; the average per capita amount was about 1,830 baht in 2003\textsuperscript{11}.

3) The 30 Baht Scheme was introduced in 2001 to cover the citizens who were neither covered by the CSMBS nor by the SSS. This particular group also included those formerly assisted by the Medical Welfare Scheme (MWS), or covered by the Voluntary Health Card Scheme (VHCS). The 30 Baht Scheme derives its name from the amount patients have to pay themselves, the co-payment, for each visit at the contracted health facility. The bulk of financing, however, comes via general tax revenue under the supervision of National Health Security Office (NHSO), Ministry of Public Health (MOPH). Health care is paid for with the per capita method, the capitation, where the amount is calculated in the basis of the number of people covered, the utilization rates, and the unit costs for both outpatient and inpatient care. In 2004, with the use of utilisation rates and unit costs data of 2002, the capitation amount was assessed by the MOPH’s International Health Policy Programme (IHPP) to be 1,447 baht, but in reality even less allocated at 1,308.5 baht. In spite of intentions to achieve equitable service provisions at affordable prices, situations of the 30 Baht Scheme are encountered with the problems of under-financed capitation amounts and budget limitations. Some have been concerning about the qualities of care provided, as well as sustainability and financing feasibility of the scheme in the long run.

A summary of main features of the three schemes is presented in Table 1.

(Here: Table 1. Thailand’s health financing system: Summary)

3.1.2 Adopting a consolidated account approach

As the study takes a macroeconomic view of Thailand’s health financing system, revenues and expenditure of the three health funds, i.e. the CSMBS, the SSS and the 30 Baht Scheme, are accordingly integrated into one consolidated National Health Security (NHS) account in the simulation experiments.

\textsuperscript{11} Regarding the SSO Report 2003, expenditure on medical benefits to claimants by the SSS was 14, 275 million baht, of which 11,904 million baht and 2,371 million baht belonged to sickness and maternity benefits, respectively.
On the revenue side, according to figure 1, the consolidated account attains funding mainly from two sources. One is the contribution revenue of the SSS while the other is the government subsidy, mainly from the MOF and NHSO, as financing of the CSMBS and the 30 Baht Scheme. On the expenditure side, health care spending is calculated based on the health care average cost data, associated utilization rates at various types of health facility, and the number of the population covered by national health security. Here, subsequently, the coverage is 100 percent of total population. Because of the unequal expenditure per capita in reality across the 3 health schemes, the average costs of health care are therefore adjusted to reflect the higher expenses of groups covered by the 30 Baht Scheme.

3.1.3 Baseline Scenario

The year 2004 is used as the starting point or base year for the projections. The following basic information is collected for that year, and if needed, for years preceding it.

1) Population and workforce structure\textsuperscript{12}

In 2004, Thailand’s population stands at about 65.1 million with average annual growth over the period 2004 to 2014 of 0.61 percent as forecasted by the National Statistical Office (NSO). Including the unemployed, it is estimated that 44.0 percent of the total population are dependents, of which about half are children under the age of fifteen. 56.0 percent or as 36.4 million of the population, are presently in the labour force, of which 2.9 million and 14.7 million are employed in the public sector and the private sector, respectively, while the remaining 18.9 million are self-employed.

2) Health care cost and utilization rate

Five types of health facility are considered in this analysis, including health centres, community hospitals, provincial hospitals, private clinics and private hospitals. Average costs for outpatient and inpatient visits at each facility type are obtained from the International Health Policy Program (IHPP), while the incidence rates of illness and utilization of the facilities are

\textsuperscript{12} Numbers of population and workforce structure are complied based on the Health and Welfare Survey (HWS 2004), the National Statistical Office (NSO).
compiled from the Health and Welfare Survey (HWS) 2004 of the NSO. Table 2 summarizes the key data.

(Here: Table 2. Average costs of health care and rates of utilisation, 2004)

3) Health insurance and consolidated account

According to the NHSO report of December 2004, even though the universal coverage is reported not yet complete, as 4.59 percent of the population are still uninsured, in the projection, we assume the coverage, as classified by population groups, sums up to 100 percent of the population.

As mentioned, the consolidated NHS account is mainly funded via two sources of revenue which are the contributions of the SSS, and the government subsidy of the CSMBS and the 30 Baht Scheme. From 2004 on, the contribution rate of the SSS has been adjusted from 3 percent to 4.5 percent\(^\text{13}\) of the insured’s salary, of which 1.5 percent each is from the insured, employer and government respectively. We can see from regarding year, government subsidies to the health sector of the MOF and the NHSO are estimated at about 87.4 billion Baht, of which 27.2 billion goes to the CSMBS and 60.2 billion\(^\text{14}\) to the 30 Baht Scheme. A small portion of the revenues is, in addition, attained partly from the co-payments of the 30 Baht Scheme.

4) Macroeconomics and public finances

Following the recovery in economic conditions, the GDP in 2004 was reported to be 6,576 billion baht with an estimate 6.0 percent real annual growth by the Bank of Thailand (BOT)\(^\text{15}\). Because the Simins will simulate the projections over a 10 year period, the real GDP

\(^{13}\) Here, even the contributions are collected for the benefits beyond medical care including allowances for cases of death and invalidity. As the aim of the study is to predict the financing feasibility of the consolidated accounts, the amounts of contributions are assumed totally integrated. In 2003 (SSO Report), the benefits paid to claimants were 15,113 million baht, of which 14,275 million baht were sickness and maternity benefits.

\(^{14}\) Of this amount, the NHSO is in practice allocated from the government to finance the non-MOPH contracted facilities of only 29.7 billion baht. The rest of the subsidies are allocated from the government via the MOPH to public facilities under MOPH’s supervisions.

\(^{15}\) See ‘Thailand’s Economic and Monetary Conditions 2004’, Bank of Thailand (BOT).
growth is therefore assumed at 5 percent instead. The annual inflation is expected to be as low as 2.7 percent and, in public finance, the government deficit is about 2.4 billion baht or 0.04 percent of the GDP.

In table 3, simulated health expenditure and financing of the consolidated account in selected years in a baseline scenario are presented.

(Here: Table 3. Simulation results in the baseline scenario)

Total health expenditure (THE) per capita is US$ 81 in 2004, projected to increase up to US$ 109.70 in 2012. The annual growth of THE is less than the economic growth of the real GDP, resulting in the decreasing trend of THE as a percentage of the GDP in the years under consideration from 3.14 percent to 2.39 percent. Government health expenditure (GHE) amounts to 11.12 percent of total government spending, which counts for a 64.5 percent share of the national THE. As the rest of spending is assumed to be increasing together with the real GDP growth, the share of GHE in the total government spending is consequently projected to decrease to 8.62 percent in 2012.

In the base year, the consolidated account’s balance is estimated to be at a deficit of 0.21 percent of the revenue. This is consistently clarified by the public criticisms on under-financing of the 30 Baht Scheme where the government subsidies via capitation basis were improperly calculated on the basis of health care costs in 2002 which were afterward found to be significantly lower than those which were actually incurred in 2004. Looking solely at the 30 Baht Scheme’s account in table 3, a 41.6 percent deficit of the revenue is the evidence. Regarding static changes from the starting point of the projection, the deficit is slightly larger in the latter years. Average health expenditure per the insured costs 1,736 baht in the base year, and is projected to increase because of inflation to 2,214 baht in 2012. As, in practice, expenditure per capita of the 30 Baht Scheme is the least compared to that of the CSMBS and the SSS (1,614 baht in 2004), it is subsequently less than the average calculated including those two health schemes. Government subsidies are counted as 75.43 percent of the consolidated account’s total revenues. The proportion of this share is projected to increase mildly during the projection period.
3.2 The alternative scenarios

3.2.1 Scenario 1: Increasing average health care costs (with quality improvements)

In this scenario, we put the attempts to improve the qualities of health care provided into the model by inferring that the average costs of all service categories are increasing annually with the same growth rate as the real GDP or economic growth. This is set up with a postulate on the inter-linkage costs and qualities, as well as efficient management and administration, of the health care provisions.

3.2.2 Scenario 2: Cost-containment practices of the CSMBS and the SSS

Successful attempts at cost and expenditure containment practices of the CSMBS and the SSS are put into this scenario with the assumption that expenditure per the insured of the CSMBS and the SSS is effectively pulled down and converged with the 30Baht Scheme. The convergence is predicted to achieve after 10 years in 2014. By way of the simulations, average health care costs of the government employees with the CSMBS and private enterprise workers with the SSS are brought down proportionately every year, and converged in 10 years with the self-employed and other population groups who are covered by the 30 Baht Scheme.

3.2.3 Scenario 3: Scenario 1 & Scenario 2

Assumptions in the former scenarios are combined and put into scenario 3. Average health care costs of all service categories are predicted to grow with the real GDP growth rate reflecting the improvements in the provided cares’ qualities. At the same time, the costs of the CSMBS and the SSS are predicted to continually converge and eventually equal those of the 30 Baht Scheme in 10 years.

3.2.4 Scenario 3.1: Scenario 3 with expanding government subsidies with real GDP growth

As extended from scenario 3, in this sub-scenario, government subsidies to the consolidated account are assumed to expand annually with the real GDP growth rate. This is with the aim to let us see how NHS financing would be under the situation when funding from the government is annually growing but constricted by the economic growth.
3.3 Summary of the simulation results

(Figures in summary are presented in table 4 with selected plotted graphs in figure 2)
(Here: Table 4. Summary of the simulation results)
(Here: Figure 2. Selected plotted figures from the simulations)

Here, the focuses are on the financial balances of the consolidated account, and the situations in public finance and national health expenditure. The comparisons across scenarios are mainly cited and mentioned in 2012.

Provided that the average costs of health care are rising with real GDP growth in scenario 1, the consolidated account’s deficit would be much larger than the ones in the baseline, standing at 54.2 percent of the revenue in 2012. Per the insured, total health expenditure (THE) climbs up as high as US $ 109.70, of which the expenditure by public health security counts for 3,358 baht (US$ 84). Government health expenditure (GHE) as percentage of total spending similarly increases up to 11.9 percent resulting in a bit larger deficit in public finance, from 0.13 percent in the baseline to 0.78 percent of the GDP.

In the second scenario, when cost containment practices are successfully integrated to the CSMBS and the SSS’s financing, THE and health expenditure by public health security per the insured keeps increasing but is less compared to those in the baseline. In 2012, they amount to US$ 106.40 and 2,090 baht (US$ 52.30), respectively. In addition, the consolidated account’s balance turns to a surplus in all the years considered, where the surplus is 4.0 percent of the revenue in 2012. The share of GHE as a percentage of total government spending declines to 8.3 percent and the government’s deficit accordingly shrinks to 0.06 percent of GDP from 0.13 percent in the baseline.

Combining these assumptions into the third scenario, we find the evidence of the figures in between those of the first and second scenarios. In 2012, the consolidated account’s balance is in deficit at 45.6 percent of the revenue. THE per capita is US$135 of which public health security is 3,169 baht (US$ 79.2) per the insured. The GHE shares a larger proportion of total
government spending, 11.3 percent, than in the baseline. The deficit of public finance is counted 0.68 percent of the GDP.

Provided, in scenario 3.1, that the government subsidies expand annually with real GDP growth, compared to the situations in scenario 3, the deficit in the consolidated account becomes massively less; only 6.8 percent of the revenue in 2012. The government subsidies, nevertheless, subsequently rise up from 6.8 percent to 10.1 percent of the total government revenue.

3.4 Balancing the consolidated account

As seen from the projections, increasing average health care costs in scenario 1 with the postulate on improvements of the provided care qualities are resulting in a massive deficit in the consolidated account’s balance, in which the magnitude is much larger than that in the baseline scenario. Even though effective cost containments in the CSMBS and the SSS are included in scenario 3, the deficit nevertheless does remain significantly large at 29.2 percent and 45.6 percent of the revenue in 2009 and 2012, respectively.

(Here: Figure 3. Systematic linkages in the consolidated national health security account)

According to the systematic linkages depicted in Figure 3, to manage the financial balance either deficit or surplus of the national health security account, in the case of Thailand, three key variables can possibly be considered. Those are the co-payment (on the expenditure side), the contribution and government subsidy (on the revenue side).

(Here: Figure 4. Balancing the consolidated account (lines of balancing proportion)).

Figure 4 depicts various proportions of the co-payment, contribution rate and (the growth rates of) government subsidies, represented by so-called “lines of balancing proportion”, those potentially bring the consolidated account to a financial balance under the three scenarios in the two referred years, 2009 and 2012. Trading-off relationships among the variables are what are noticeable in the figure. At a given rate (or amount) of the co-payment, a decrease in the growth rate of government subsidies must be compensated for with an increase in the contribution rate in order to maintain the consolidated account in balance, and vice versa. Provided that the co-
payment rate is adjusted higher, rates of government subsidies’ growth and the contribution could be lowered down accordingly, whereby lines of balancing proportion would shift to the left.

Comparing across the years, to balance the account when the government subsidies’ growth decreases, the substituting increase in the contribution rate is necessarily higher in 2012, where the lines of balancing proportion are flatter, than in 2009. This is explained by the “accumulating growth effects” of the government subsidies as years pass. Given a specific growth rate, the amount of government subsidies in the latter years are accumulated and continuously getting larger. A percent decrease in the growth in a specific year, therefore, needs to be compensated for or substituted with a higher increase in the contribution rate in the latter years.

Focusing on the government subsidies, an interesting question might be at which rate the subsidies should grow annually in order to keep the consolidated account sustainable in its financial balance. The answer can be drawn from the lines of balancing proportion in Figure 4. Under a given scenario, for example, the lines in 2012 are not lying above those in 2009, if we graph them in the same plotting area, but intersecting. The intersected point represents the growth rate of government subsidy and a specific combination of the co-payment and contribution rate, which proportionately balance the deficit (or surplus) in the consolidated account across the years 2009 and 2012. Even if in practice there are many other factors that need to be taken into account, one can roughly get an idea of how much the government should suitably subsidize and, as well, at which rates the possible co-payment and contribution should be set in order to sustain the national health security account.

3.5 Public finance and the constraints in subsidizing

In the case of the deficit, to offset the balance in the consolidated account, feasible key variables are given as illustrated in the last section, which are the contribution rate, co-payment and government subsidies. The latter is practically the most flexible to adjust year by year when

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16 If we look carefully, the relationship between the government subsidy growth and the contribution rate is not linear but concave. To decrease 1 percent of subsidy growth at its high level, the contribution rate has to increase proportionately higher than when decreasing the 1 percent of growth at its low level. This is because of the accumulation effects of the growth rate.
the financing of the health security is inadequate. It, nevertheless, is constrained by the situation in public finance and the limited financial capacities of the government, especially in developing countries, with no exception for Thailand. The more the government spends (not only on the health sector), the more public finance’s capacities are limited. Focusing on scenario 3, this section deliberates possible options to offset the estimated account deficit, and, at the same time, contains the financial burdens of the government subsidies.

(Here: Table 5. Balancing the consolidated account: Scenario 3 in 2009 (-29.20% deficit))

Duplicated into table format from figure 4 (c), table 5 represents the proportions of the contribution rate, co-payment and government subsidies’ growth rate which offset the 29.2 percent of revenue deficit in the consolidated account in 2009 under scenario 3. Supposing the capacity of the Thai government in subsidising is limited, dependent upon the national economic situations, the subsidies would still be growing but with a rate maximally not higher than the real economic growth rate or 5.0 percent. Under this constraint, two other key variables – the contribution rate and the co-payment - have to be carefully considered and determined. Even if in practice the contribution and the co-payment are collected and managed under different health schemes, the SSS and the 30 Baht Scheme, cooperation and mutual decision making as well as long term planning between the schemes in order to sustain the national health security financing would be applicable if it is concretely considered as a national agenda.

[Here: Table 5. Balancing the consolidated account: Scenario 3 in 2009 (-29.20% deficit)]

[Here: Figure 4 (c), duplicated]

Regarding figure 4 (c), provided that government subsidies are bounded with 5.0 percent annual growth, to maintain the co-payment of the 30 Baht Scheme at 30 baht per episode of utilisation, the contribution rate of the SSS must be raised up to 6.2 percent of the insured’s salary. On the other hand, to maintain the contribution at the current rate of 4.5 percent instead, the co-payment must be adjusted to substitute at much higher than 15 percent of health care costs at each utilization. The compromising solutions, as a result, must be cooperatively determined.
concerning the feasibility, acceptability and, importantly, equity among the insured population groups with each health security scheme.

Complementarily, by setting another assumption as the forth scenario, we found the **expansion of compliance rate with the SSS** as another feasible option to finance the consolidated account taking into consideration the constraints in government subsidies.

(Here: Table 6. Simulation results: Scenario 4 in comparison with the baseline scenario)

The simulation results regarding the consolidated account’s financial balance and government subsidies as a percentage of government revenue under scenario 4, where the compliance rate with the SSS is assumed continually increasing and achieving its completion (100 percent) after ten years\(^\text{17}\), are presented in Table 6. Simply compared to the deficit in the baseline scenario, there are 7.2 percent and 10.9 percent surpluses of the revenue in the health security account under scenario 4 in 2009 and 2012, respectively. With the additional assumption that the government would subsidize only the amount that retains the consolidated account in its balance, the evidence shows that, as a percentage of government revenue, this would save a portion of subsidies in the baseline from 7.0 percent to 6.2 percent in 2009, and 6.8 percent to 5.6 percent in 2012.

Summarily, with limited capacity of national public finance, the contribution rate and the co-payment should be compromisingly determined to maintain the financial balance of the national health security account and its sustainability in the long run. Marked within the dashed box in figure 3, expansions of the coverage and compliance rate with the SSS are also a possible alternative for Thailand to relieve the financing burdens of the government in terms of government subsidies.

\(^\text{17}\) In 2004, out of 14.71 million workers in the private sector who are obliged to insure with the SSS, only 7.83 million (53.23 percent) have already been registered. Expanding coverage of the SSS would result in the shrinkage of the coverage of the 30 Baht Scheme at the same time.
4. Summary and conclusions

As indicated, the issue of cost containment can be looked at from two angles, the health system perspective and the macro-economic perspective. The former concerns the policies focusing on monetary and non-monetary incentives that affect the demand and supply of health services. The latter, on the other hand, tries to elucidate the policies and their impacts in the context of the health system at the national level, mainly concerning the availability of financial resources and the constraints that relate to the structure and evolution of the macro-economy including important sectors such as public finance.

This paper adopts the latter perspective in the context of Thailand’s health financing system with use of the simulation model called “Simins” in the experiments. The financial accounts, revenues and expenditure, of the three existing health financing schemes – the CSMBS, the SSS and the 30 Baht Scheme – are combined into one consolidated National Health Security (NHS) account. A number of alternative scenarios are set up and projected situations in the future with the simulation. With the set of assumptions in each scenario, analyses are mainly on the forecast of the consolidated account’s financial balance, situations of health expenditure and public finances of the government. The contribution rate of the SSS, the co-payments and government subsidies are considered as key financing variables of the NHS account, in which the latter is closely dependent on macro-economic conditions and financing capabilities of public finance. For a developing country like Thailand where universal coverage is funded hugely via government subsidizations, which are nevertheless limited by the public finance constraints, mutual compromises across health financing schemes regarding the contribution rate and the co-payment are essential. Finer compliance with the SSS and expansion of its coverage is, in addition, another potential solution to relieve the government burdens and sustain the social security system in the long run.

As in most simulation studies, the experimental findings presented in this paper nevertheless contain some weaknesses regarding validities of assumptions as well as
appropriateness of the model used. Presently, even if the consolidation of the 3 health schemes has not been achieved yet and the expenditure of the UC, mainly via the 30 Baht Scheme, is not only for curative health but also for health promotion and prevention\(^{18}\), the finding from the simulation experiments in this study more or less provides us with some implications concerning health financing sustainability and cost containment in the macro-perspective.

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\(^{18}\) According to the basic structure of Simins model in figure 1, on the expenditure side of the health insurance account, health spending includes only costs of health care and curative works. Costs of health promotion and prevention (PP) works are assumed counted as parts of the administrative costs and reserves. This might be underestimating the total spending as the UC policy of Thailand was declared to be focusing on PP works and that the budget spent on PP works might be higher than the estimates from the model.
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