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## The Performance of Medicare I: An Economic Evaluation

*Ma. Luisa I. Beringuela*

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**THE PERFORMANCE OF MEDICARE I:  
AN ECONOMIC EVALUATION**

*Maria Luisa I. Beringuela*

**July 1993**

**Philippine Institute for Development Studies**

## Table of Contents

I.	INTRODUCTION . . . . .	1
II.	HEALTH INSURANCE . . . . .	4
III.	A REVIEW OF THE LITERATURE . . . . .	11
IV.	THE DISTRIBUTION OF MEDICARE CONTRIBUTIONS AND BENEFITS . . . . .	21
V.	THE EQUITY AND EFFICIENCY OF MEDICARE FINANCING . . . . .	34
VI.	SUMMARY AND CONCLUSIONS . . . . .	42
Appendix A.	LIST OF GSIS REGIONAL OFFICES . . . . .	43
Appendix B.	CROSS-TABULATIONS FROM THE GSIS SAMPLE . . . . .	45
Appendix C.	TECHNICAL DESCRIPTION OF THE CGE MODEL . . . . .	47
REFERENCES	. . . . .	53

## List of Tables

Chronological Change in Medicare Contributions, 1972-93: Legal Basis . . . . .	8
Medicare Program Coverage, 1972-1991 . . . . .	9
Summary of Important Findings on Medicare . . . . .	12
Medicare Contributions, Benefits, and Salary Distribution within GSIS Sample, Philippines, 1982 . . . . .	18
Income, Claims, Contributions and Expenditure Experience by Income Groups, GSIS, 1991-1992 . . . . .	23
Income, Claims, Contributions and Expenditure Experience by Income Groups, SSS, (March-August 1992) . . . . .	24
Income, Claims, Contributions and Expenditure Experience by Age Groups, GSIS, 1991-1992 . . . . .	26
Income, Claims, Contributions and Expenditure Experience by Age Groups, SSS, (March-August 1992) . . . . .	26
Income, Claims, Contributions and Expenditure Experience by Gender, GSIS, 1991-1992 . . . . .	27
Income, Claims, Contributions and Expenditure Experience by Gender, SSS, (March-August 1992) . . . . .	28
Logit Operation on the GSIS Data . . . . .	32
Logit Operation on SSS Data . . . . .	33
Percentage Change in Output, Prices and Unit Profits . . . . .	38
Percent Changes in Factor Prices . . . . .	38
Changes in Income Per Quintile . . . . .	40

## List of Figures

Cross Subsidization Across Regions . . . . .	29
Schematic Diagram of Effects of the Payroll Tax . . . . .	37

## I. INTRODUCTION

The Philippine Medical Care Plan, or simply Medicare, is basically the National Health Insurance (NHI) scheme of the country. In foreign countries, the Medicare system is classified under social insurance, compulsory health insurance or statutory health insurance.

In the last two and a half decades, interest in health insurance through social security systems grew as a result of the International Conference on Primary Health Care held in Alma Ata (USSR) in 1978. Since a healthy population is needed by Third World countries in order to achieve economic development, the goal of Health for All by the Year 2000 was set. Developing countries expressed their commitment to achieve this goal despite their awareness of the financial constraints that face them. They were also aware that foreign aid for health was not likely to increase due to the worldwide recession and the general slowdown in the developed countries. So, in spite of their own economic difficulties, developing countries were encouraged first, to use existing resources efficiently, and second, to come up with new sources of financing for health. Compulsory health insurance is considered as one of the promising sources of financing for health along with the charging of user fees for government provided health services, the raising of funds through nongovernmental organizations (NGOs), the requiring of employers to provide health benefits, among others.

In spite of the purported benefits of national health insurance, Filipinos are generally indifferent to the Program. One major reason for this is that it is still irrelevant to more than half of the 62 million Filipinos. These incidentally are the poor, employed in rural areas or in the informal sector and the unemployed who are more in need of the financial help in order to gain access to medical services. For those who are covered, premiums are low anyway. In addition, some negative perceptions on Medicare are that there is a lot of red tape involved in the process of claiming benefits and that Medicare benefits are too small compared with the total hospital bill. For those who have not claimed benefits especially among the urban poor, they feel that the benefits are not commensurate with the premiums (Malanyaon, 1993, pp. 8 & 11).

A complete economic evaluation of Medicare is thus necessary in order to identify the weaknesses in the design of the current Program. Reforms could then be implemented so that Medicare could better serve the needs of the covered population. Moreover, the economic evaluation is needed to identify the possible unintended effects of the Program on the rest of the population through its effects on the medical services market and the economic burden in terms of premium contributions which it imposes. However, due to

time and logistical constraints, a complete evaluation is impossible under this research. The study was further limited by the fact that at the time of the study, only secondary data could be analyzed since the primary data required for a complete evaluation was still non-existent. Thus, the specific objectives of this paper were narrowed into two:

1. the identification of the cross subsidies occurring within the Medicare population; and
2. the identification of the distribution of the burden of Medicare contributions through an incidence analysis of the premium contribution.

The aim of this paper is basically to answer two very important questions: who benefits from Medicare and who pays for these benefits. Whereas the first objective focuses on the covered population, the second entertains the possibility that though benefits are enjoyed only by those who are covered, other sectors of society are partly shouldering the burden.

From the outset, it must be made clear that this paper is only one of the three component studies on Medicare under the Philippine Institute for Development Studies-Department of Health (PIDS-DOH) Project. This study is the economic component of the first phase which is tasked with identifying the inequities and inefficiencies of the program. The other component focuses on administrative issues. In the second phase, the economic and administrative components are linked in order to come up with a set of alternative reform measures to correct the flaws discovered in the first phase. The linking will ensure that proposed reforms that address, for example, the inequities in the system will be administratively feasible and financially sustainable. Therefore, general directions on policy reforms may be mentioned in this paper but the normative aspects which constitute the logical conclusion to this study will be dealt with in a separate paper.

### Organization of the Paper

Section II places the study within the context of the health insurance industry. The first section is a brief introduction to the general principles applied in the health insurance industry under a free market system. In contrast, the second section deals with social health insurance and gives a brief introduction to the Philippine Medical Care Plan or Medicare.

Section III is a review of the literature which summarizes the major conclusions of past studies on Medicare. Since the focus of this study is very narrow, this chapter provides an overview of

other important issues and whenever possible, a comment on how the conclusions were arrived at.

Sections IV and V comprise the main focus of this paper. The former looks at cross-subsidies within the Medicare population while the latter tries to identify which groups in Philippine society partly shoulder the burden of paying Medicare benefits even though they are not entitled to the benefits themselves.

And finally, Section VI summarizes all the important conclusions from the two previous sections.



## II. HEALTH INSURANCE

### I. GENERAL PRINCIPLES<sup>1</sup>

Health insurance refers to insurance policies which provide benefits in case of illness or injury. This paper concentrates on "medical expense coverage" which reimburses the patient and/or the health provider all or part of the medical expenses incurred by the beneficiaries of the policy. For purposes of this study, two types of "medical expense coverage" are involved, namely:

1. traditional health insurance as exemplified by the Blue Cross and Blue Shield plans in the U.S. which basically offer hospital insurance;
2. services provided by Health Maintenance Organizations (HMOs) which cover not only in-patient care but preventive as well as out-patient medical and dental services. HMOs usually limit the choice of the provider to facilities and doctors who are part of the HMO or those with whom the HMO has a special arrangement.

Medical expense coverage, especially hospital insurance, satisfies the following characteristics that make an event insurable:

1. The loss must occur by chance. The insured must not be able to predict when the loss will occur nor should he intentionally cause it. The question has arisen whether to consider HMOs as insurance companies since they cover routine out-patient and preventive services such as annual physical checkup and dental visits which are actually scheduled events. This paper takes the view that HMOs still offer insurance if they cover hospital expenses.
2. The loss must be definite. Most insurers usually incorporate a maximum reimbursable amount in the policy. In the event of loss, the insurer will pay either the amount equal to the medical bill or the maximum insurable amount, whichever is less.
3. The loss must be significant. In the U.S., hospital insurance is still the most widely purchased type of health insurance because in-patient hospital care costs

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<sup>1</sup>Unless otherwise stated, this part of Section I is based on Long and Morton (1988, pp. 1-32; 260-61).

more than out-patient medical services (Pauly, 1986, p. 635).

4. The rate of loss must be predictable. Insurance companies usually use morbidity tables in assessing the risk which a person or group represents. These tables, together with other morbidity factors, provide the bases for the premiums set for the policy owner.
5. The loss must not be catastrophic to the insurer. The insurance company must make certain that a single event will not cause its financial collapse. One way an insurer can do this is by spreading the risk. For example, to avert the possible loss caused by an epidemic, the insurer should try to cover a large geographical area and groups of people with varying incidence of illness. Another way of spreading risks with other insurance companies is through reinsurance. The insurer can ask another insurance company to pay all or part of the benefits of particular policies in exchange for all or part of the premiums. The insured usually does not know that his policy has been reinsured.

Aside from the principles briefly discussed above, the insurer must consider the following before selling an insurance policy. First, he must see to it that the beneficiary of the policy has an insurable interest. In other words, even with insurance the beneficiary should still prefer that the event will not occur.

However, health insurance companies still have to guard against moral hazard. Moral hazard means that an insured event is more likely to occur than an uninsured one. It also takes the form of higher expenditures on hospital and physician services. This is the reason why many health insurance policies have cost-sharing features (Ginsburg and Manheim, 1973, p. 143) such as -

1. a deductible where the patient pays for the initial costs, say, P1,000, after which the insurance company pays for the rest of the medical expenses; or
2. a coinsurance where the patient shoulders a specified percentage of the medical expenses; or
3. a copayment where the patient pays a specific amount per unit of service availed of; or
4. the case where an insurance company sets a limit on the benefits, a perfect example of which is the Medicare benefit structure.

Second, the insurer must guard against adverse selection, wherein people who have a greater likelihood of getting sick will

more likely apply for health insurance. Thus, the insurer should classify applicants according to their potential degree of risk. The premiums reflect the degree of risk they represent.

In the U.S. and Canada, the insurance industry is heavily regulated to ensure that companies can meet their obligations to policy holders. Several conditions are deemed imperative. Firstly, premiums must be adequate so that the insurer is able to pay for all the stipulated benefits in the policies sold when the need arises. Secondly, investments must be prudent. Regulation usually prevents insurance companies from investing in high-risk assets. Thirdly, the benefits offered and the conditions for granting the benefits must meet government standards.

In the Philippines, the Insurance Commission (IC) is the regulatory agency that oversees the insurance industry. Since health insurance is not considered profitable, it is usually just an add-on to life insurance policies.<sup>2</sup> Insurance companies which offer traditional health insurance complain that the IC does not treat health insurance differently from life insurance so that regulations that are more appropriate to them do not exist (Gamboa, 1991, pp. 257-61). On the other hand, HMOs are more optimistic about their future but no government agency is presently regulating their activities even though they are not averse to some form of government regulation (Gamboa, p. 205).

## 2. NATIONAL HEALTH INSURANCE AND THE PHILIPPINE MEDICAL CARE PLAN

National Health Insurance refers to legislated health benefits which are compulsory in nature. In the Philippines, Republic Act No. 6111 was signed into law on August 4, 1969 but was implemented only in 1972. The law created the Philippine Medical Care Commission (PMCC) as the overall policy-making and coordinating body to oversee the Medicare Program. The Government Service Insurance System (GSIS) and the Social Security System (SSS) were tasked with collecting premiums, distributing benefit payments and managing the Health Insurance Fund (HIF), the reserves or unused premiums which could be used to earn investment income<sup>3</sup>.

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<sup>2</sup>According to Gamboa (1991, p. 255) health insurance policies are marketed only to complete the menu of insurance products. In contrast, the more optimistic outlook of HMOs could be an indication that they are making more money than the traditional indemnity health insurance.

<sup>3</sup>For a more detailed listing of the functions of the three agencies and the evaluation of how well these functions are being performed, please refer to Gonzales et al. (1993).

The objectives of Medicare as embodied in R.A. 6111 are to wit:

- "1) to provide medical care to residents of the country in an evolutionary way within our economic means and capability as a nation; and
- 2) to provide our people with a viable means of helping themselves pay for adequate medical care."

In other words, two of the explicit aims of Medicare are to provide better access to medical care for Filipinos and to upgrade the quality of the care that they will receive.

A number of reasons have been put forward on why NHI has become popular among rich and poor nations alike:

1. Since health care is closely related to Medicare objectives, it is considered a right in many countries, and financial hardship should not prevent a person from obtaining health services when the need arises (Fuchs, 1976, p. 351).
2. Especially in developing countries where communicable diseases are still prevalent, there are positive externalities associated with the consumption of medical care. In developed nations, consumption externalities may be more applicable, i.e., a rich person may derive satisfaction from helping a person who cannot obtain medical care by his own means (Fuchs, p. 351).
3. Rothschild and Stiglitz (1976) showed that, under a perfectly competitive insurance market, the presence of high risk individuals imposes costs on low-risk individuals. Under the NHI, risk-pooling is maximized since adverse selection is absent. Furthermore, everyone benefits from the lower premiums although subsidization of high risk individuals still occurs.
4. Due to the asymmetry of information and collusion through various medical associations and societies, health providers are perceived to exercise monopolistic control in the health services market, so that the prevailing price which they are able to set is higher than what might obtain under conditions of perfect competition. One way by which the government can correct this market imperfection is by dealing with the providers as a monopolistic buyer through the NHI (Fuchs, p. 350).
5. Politically, the NHI may be used as a signal by the government that it is working for more equality so as to

reduce tensions between the haves and have-nots (Fuchs, pp. 252-53).

6. Where industrialization and urbanization have weakened family ties and traditional religion, the state, through the NHI, could take over the role of the family and organized religion (Fuchs, pp. 256-57).

In statutory health insurance programs especially in developing countries, there are mainly two ways by which health services are provided: One is through "direct" provision of services, meaning the programs operate the facilities which provide health services to the covered population. Another is through the "indirect" method which has two forms: (1) direct payment to providers, and (2) indirect payment by reimbursing the patient for his/her health expenses (Ron, Abel-Smith and Tamburi, 1990, p. 30).

Medicare covers hospitalization expenses only and some out-patient surgical services (i.e., dental and family planning benefits) through the indirect method. The PMCC accredits a nationwide network of hospitals and physicians to provide medical services to members and their dependents. The SSS and GSIS directly pays the providers, and members are rarely reimbursed for their hospital expenses.

Whatever the manner of provision of care chosen by countries, NHI schemes have the following commonalities. First, premiums are based on the ability to pay, and the health risk of the person is not considered. For example, Table 1 shows that Medicare contributions are essentially payroll taxes shared equally by the employer and the employee. Contributions are 2.5% of the basic

Table 1  
CHRONOLOGICAL CHANGE IN MEDICARE CONTRIBUTIONS, 1972 - 1993: LEGAL BASIS

Contribution	1972	1978	1987	1991	1992	1993
1. Base						
a) Rate						
Employer	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%
Employee	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%
b) Wage Ceiling	300	600	1,000	2,000	2,500	3,000
2. Legal Basis						
a) Law	RA 6111	PD 1519	EO 1079	EO 365	EO 365	EO 365
b) Approval	8-4-69	6-11-78	1-20-86	7-28-89	7-28-89	7-28-89
c) Effectivity	4-1-72	10-1-87	1-1-87	1-1-91	1-1-92	1-1-93

Source: Phil. Medical Care Commission

salary and are proportional up to the wage ceiling. Starting in 1993, an employee whose monthly income is P3,000 and below pays a tax equal to 2.5% of his income. Unfortunately, a regressive feature of payroll taxes is the wage ceiling, beyond which contributions become a flat rate. For example, at the present wage

ceiling of P3,000 a month, the maximum tax paid by each member is P75.00 (employer's and employee's share combined). The tax is regressive since a worker earning P3,000 monthly pays exactly the same amount as a worker who earns P20,000.

The rationale behind the arrangement to base premiums on the ability to pay is an implicit agreement among the populace that the rich and the healthy should subsidize the poor and the sickly, and that those who are more fortunate will bear some social responsibility for those who are less fortunate.

Second, NHI programs are compulsory by nature and universal coverage is usually targeted. For most of the developing world, this target has not been achieved yet. In the case of the Philippines, the country adopted a gradual implementation strategy. Phase I of Medicare initially covered GSIS and SSS members only. Through the years, coverage was expanded to include dependents and retirees. Table 2 is a listing of the program's coverage base from 1972 up to 1991 with the latest figures representing estimates from PMCC. Although in absolute terms, coverage has increased from 8.9

Table 2  
MEDICARE PROGRAM COVERAGE, 1972-1991

Year	S S S			GSIS			Grand Total ( M )	Percentage of population
	Members ( M )	Dependents & retirees ( M )	Total ( M )	Members ( M )	Dependents & retirees ( M )	Total ( M )		
1972	1.27	5.08	6.35	0.51	2.04	2.55	8.90	22.797
1975	2.01	8.04	10.05	0.71	2.84	3.55	13.60	32.182
1980	3.30	13.20	16.50	1.05	4.20	5.25	21.75	45.015
1985	4.51	18.04	22.55	1.49	5.96	7.45	30.00	55.058
1990	3.78	15.12	18.90	1.28	5.12	6.40	25.30	41.700
1991	3.87	15.48	19.35	1.30	5.20	6.50	25.85	41.781

Source: Phil. Medicare Commission.  
Population figures courtesy of the National Statistics Office.

million in 1972 to 25.85 million in 1991, Phase I still fails to cover a majority of the Philippine population. Furthermore, there is reason to believe that the given coverage estimate is overstated.<sup>4</sup>

Phase II of the program was envisioned by legislators to cover the rest of the population. The PMCC is now conducting a pilot testing of some areas for Phase II implementation. Implementation on a nationwide basis is being hampered by significant difficulties, the most important of which are: (1) the low and variable incomes of the population concerned; (2) the dispersion

<sup>4</sup>For details, please refer to Gonzales et al. (1993).

of small villages; and (3) the negative impressions associated with Phase I.

The main criticism against this gradual implementation strategy is that it is easier to cover the relatively better off urban and formally employed workers and that it usually fails to reach the poor who are unemployed or employed in the informal sector who are more in need of the safety net provided by the NHI.

Finally, the Philippines, like other developing nations, is faced with the challenge of choosing an appropriate role for the NHI in disease prevention and out-patient care. Those who propose the inclusion of such services in the NHI assert that preventive services (especially immunization) are underutilized in developing nations but very cost-effective. Furthermore, early detection and treatment of diseases through coverage of out-patient care may help in cost containment through lower utilization of costly hospital services.

However, insurance coverage of routine and less costly health services involves high administrative costs. Also, the NHI might overlap with some of the functions which the Ministries of Health could perform with greater efficiency, e.g., public health services such as immunization, the promotion of health and hygiene through information, sanitation, etc. Clearly, each country (given local conditions and culture) must make its own choice concerning the basic health package to be covered. In addition, it must complement and not compete with the functions of the Health Ministry and must adopt the appropriate insurance or prepayment scheme.

The Medicare law provides for the gradual evolution of the Program. The last two decades, however, only saw some minor changes so that the Program remains essentially unchanged. It is hoped that the PIDS-DOH Project's component studies would become part of the overall effort to improve the Medicare Program and complement the DOH's efforts to nurture a healthier population for nation-building.

### III. A REVIEW OF THE LITERATURE

Table 3 is a matrix of some important issues on Medicare and of the comments/conclusions of a number of authors on these issues. The main purpose of the matrix is to update readers on the prevailing views regarding the Medicare Program. An added bonus is that it provides a quick list of areas for future research and the possible future initiatives which the PMCC, DOH and policymakers could take. Moreover, it shows what has already been done on the topic and, therefore, provides the background against which the discussion of the contributions of this paper will be made.

The following discussion devotes attention to a few details which could not be included in the table such as the specific objectives of each paper and the methodologies or data used as basis for their conclusions.

The first paper by Jeffers (1990) is actually a draft terms of reference for policy researches specifically aimed at improving Program I and implementing Program II. The comments in Table 3 are from his discussion of the current problems of Program I. Since Jeffers's paper is not a research undertaking, there is no explicit discussion on methodology. This author believes that the comments are based on interviews, past literature and some familiarity with the features of the program.

Ron's (1989) paper, on the other hand, is a component study on the SSS sponsored by the International Labor Office (ILO) which looks at medical benefits. Through a review of the medical benefits, coverage and system of provision of medical care of the Medicare Program, the paper aims to (1) help the SSS in developing more effective schemes in extending medical benefit to the covered population; (2) determine the feasibility of expanding coverage among the working population; and (3) institute methods to improve the efficiency of services.

Ron's activities included interviews with officials from SSS, the DOH, Employees Compensation Commission (ECC), PMCC, World Health Organization-Western Pacific Regional Office (WHO-WPRO), and academic institutions. He visited regional offices and hospital facilities, and also analyzed a sample of claims using some national statistics on GNP and the health status.

Solari is a consultant at Resources for Child Health (REACH) who was requested by the DOH to identify problems and make recommendations on how to improve the Medicare Program in addition to providing assistance on the design and implementation of Program II and to analyze the existing HMO industry in the country. His



Table 3. Summary of Important Findings on Medicare

Issues	Jeffers (1990)	Ron (1989)	Solari (1988)	Gamboa (1991)	Griffin (1985)
Coverage	<p>Because the self-employed and the unemployed are not covered, Medicare coverage was judged inadequate and inequitable. According to the author, "there is evidence" that even for Program I only 70% of firms and employees are enrolled. Full enrollment is important for risk pooling and cross subsidization of low income groups.</p>	<p>The author noted that when number of claims per 100 members were calculated on a regional basis, a more than 10-fold variation exists between the lowest (2.87) to the highest number (30.03) claims/100 members. The serious problem of estimating actual number of people covered cropped up.</p> <p>Due to the special health problems caused by urbanization, efforts should be made to cover more of the urban population apart from the efforts for expansion in rural areas.</p>	<p>Since program coverage only reached approximately 50% of the population, it still falls short of the stated goal of universal coverage.</p>	<p>Comparing Medicare membership to total employment figures, Gamboa estimates that only 20% of employed sector is covered by Medicare. He also considers the current situation where coverage has not reached Program II population as inequitable.</p>	<p>Citing the comparable values of percentage of Medicare members to total employed and percentage of non-agricultural workers to total employed especially from 1976 to the eighties, the authors concluded that coverage excludes majority of the rural population. However, statistics on regional membership indicate that large numbers of workers are covered in every region.</p>
Cost-Sharing	<p>Although support value is targetted at 70% of hospital costs, it is estimated that only 33% are covered [Estimate could be based on PMCC survey - MLIB].</p> <p>Note: Support value is equal to the proportion of hospital costs shouldered by Medicare.</p>	<p>Using a simple random sample of 100 claims, the support value for primary, secondary and tertiary hospitals were calculated using claim forms which does not include professional fees. The expected results were validated - the higher the hospital level, the lower support value; or higher out-of-pocket costs were shouldered by the patient in tertiary hospitals. Thus, Ron questions the equity of the program and whether it really provides an insurance protection especially for serious illnesses requiring tertiary level care.</p>	<p>Due to unequal benefits provided by SSS and GSIS, support values are only 48% and 28% respectively which falls short of the stated goal of helping Filipinos pay for adequate medical care.</p>	<p>Citing PMCC Hospital Survey estimates of support value, the author observed that out-of-pocket expenses have been increasing and is greatest at the tertiary level of confinement.</p>	<p>The authors showed that average benefit payments made through the years are declining in real terms. Either hospitals or patients are absorbing the fall. The authors are inclined to believe that the latter bears the burden because real consumption expenditures on medical care increased during the same period when real benefit payments were falling.</p>

Issues	Jeffers (1990)	Ron (1989)	Solari (1988)	Gambao (1991)	Griffin (1985)
Contributions	<p>The P1,000 wage ceiling on contributions is regressive since the rich pay less for the same benefits. This low ceiling decreases the funds available and limits cross subsidization.</p>	<p>Although no actual calculations were made, contributions of 2.5% of income up to P1,000 wage ceiling was considered inadequate if 70% support value is to be achieved. So the ceiling must be raised. Furthermore, requiring only 3 months contribution of the 12 months prior to hospitalization encourages irregular payment so require 3 months payment over the past 6 months instead of 12.</p>	<p>Those earning salaries greater than P 1,000 a month are contributing proportionally less than 2.5 percent of their income, this deprives the Health Insurance Fund of needed funds. Thus, the income ceiling must be increased or even removed.</p>	<p>The income ceiling is considered a regressive feature of the contribution structure. Low premiums also may contribute to apathy to the program though this still has to be empirically verified.</p>	<p>Results from the OSIS sample showed that due to the income ceiling, proportion of income going to contributions decreases, meaning the tax structure is regressive. In addition, only salaries are included so income from rents, profits, and interest escape Medicare taxation.</p>
Benefits	<p>Since inpatient care only is currently covered, the author surmises that this encourages overutilization of hospital services.</p> <p>Higher reimbursement rates in tertiary setting encourages patients with simple illnesses to use these facilities even if a lower level facility could handle the case.</p> <p>He therefore recommended the reimbursement of providers using a modified DRG which pays the same amount regardless of setting and proposed that research be undertaken to study the actuarial feasibility of different packages which seriously considers coverage of outpatient services.</p>	<p>Covering inpatient care only implies that the patient reaches a relatively severe stage of illness before he can avail of the benefits. Ron strongly suggests that Medicare should help provide comprehensive care to the Philippine population which includes primary health care.</p> <p>He also cites statistics of high maternal deaths, high infant and child mortality to justify coverage of hospital child deliveries (conditional upon registration of pregnant woman for pre-natal care starting in the first trimester) including BCG vaccination and health education (breast feeding, infant care, child spacing, etc.)</p>	<p>Low Medicare support value and limitation of benefits to inpatient care creates incentives to hospitalize cases which could be treated in an outpatient basis. It was thus recommended that the financial repercussions of including outpatient benefits be studied.</p>	<p>Citing statistics from FMCC, the author found that though total benefit payments were increasing, availment rates are roughly constant thus the increase has been caused by inflation since real benefits have been going down through the years.</p> <p>Higher reimbursable allowances for higher level hospitals encourages use of these facilities.</p> <p>Though benefit levels should be increased, this must be accompanied by control of abuses and mechanisms to contain costs.</p>	<p>Again, using the OSIS sample, Griffin et al found that although lower income groups make more claims, average value of claims are higher for higher income groups resulting in more or less constant total benefits across quartiles. Thus, they concluded that "the system successfully provides payments according to need."</p> <p>For the SSS and OSIS, only 11% of the claims in the sample involve surgery which raises the question of unnecessary hospitalization to qualify for Medicare benefits.</p> <p>The authors also mentioned that advocates of primary health care believe that benefit limitation to curative care is "inappropriate to the needs of poor rural residents."</p>
Cost Containment	<p>He recommended the use of modified DRG to simplify claims processing and help in cost containment.</p>	<p>It is recommended that physicians should not be paid on a fee-for-service method but by capitation especially if primary health care is included in the benefits and coverage in rural areas is expanded.</p>	<p>Increasing benefit ceilings under a fee-for-service environment may be acting as an inflationary force. The Program could work with HMOs in the long run for better control of costs.</p>	<p>The current program does not promote cost containment and quality control. Lack of policies and initiatives in this area in past years point to this fact.</p>	

Issues	Jeffers (1990)	Ron (1989)	Solari (1988)	Camboa (1991)	Griffin (1985)
Reimbursement	<p>The author commented that few (if any) cost studies were made to serve as basis for determining the costs to be reimbursed and for services rendered in the appropriate settings.</p>	<p>Ron recommends that Medicare reimburses hospitals as a percentage of "an appropriate agreed total per diem charge", equal to  60% - Primary  70% - Secondary  75% - Tertiary  which according to him will result in less abuse and more savings</p>	<p>In the short run, prices charged to Medicare patients should be controlled. Patients who go to providers who agree to the negotiated prices can get 70% support value. For those providers who will not charge the set prices, partial or total exclusion from Medicare benefits. In the mid-term and in the long run, the use of DRGs and contracting with HMOs respectively are recommended.</p>	<p>Camboa sets the following goals for the reimbursement scheme—"to promote cost containment, to strengthen quality of services and to encourage the creation and optimal utilization of medical resources."</p>	
Administrative Set Up	<p>Jeffers recommended that a study should be made on the activities of SSS and GSIS for the purpose of making their operations more integrated. At the least, uniform policies and procedures should be adopted but a merger which is even more desirable will not only achieve uniformity but "economies of scale as well. Decentralization should also be studied thoroughly.</p>		<p>Differences in policies by SSS and GSIS with the apparent disregard of PMCC's overall policy-making functions was noted. Thus, it was suggested that the systems adopt uniform claims and monitoring procedures.</p>	<p>"The fragmentation of the Medicare Program's policy and operational requirements among 3 different, independent government agencies inhibits full exploitation of opportunities for economies of scale and for more coordinated and efficient operations."</p>	<p>Since the SSS and GSIS administers the program for their respective members, PMCC plays a minor/insignificant role in day-to-day operations.</p>
HIF Management	<p>Although no figures were presented, GSIS reserves (equal to one year of projected outlays) was considered adequate while SSS reserves (five years) was considered excessive.</p>		<p>Citing a few statistics, the difference in the financial performance between SSS and GSIS was noted. This difference was explained by the higher utilization rates in GSIS mainly due to coverage of retirees. Additional analysis of financial performance was recommended.</p>	<p>Again using PMCC HIF data, combined reserve capacity of the two systems is equal to two years of operation which according to actuaries is a safe level. He also noted the large differences in the financial performance of the two systems.  The author approves of the growing independence of the HIF from premium contributions and the greater importance of investment income.  Finally, he suggests that serious consideration be given to merging the two funds.</p>	<p><u>Lugue (1988)</u> [This cell only]  In the theoretical framework of the study GSIS was classified as having a strong bias for responsiveness at the expense of stability due mainly to high utilization rates and vice versa for SSS. The situation, according to him is not optimal in the social welfare viewpoint. He thus proposed several ways to increase GSIS resources 1) merging SSS and GSIS HIF 2) lend GSIS funds and 3) government to subsidize public employees which he favors.</p>

Issues	Jeffers (1990)	Ron (1989)	Solari (1988)	Gamboa (1991)	Griffin (1985)
Fraud and Abuse	<p>Fraud and abuse of the current program was noted. Aside from "actual observation" and "anecdotal evidence", a trial monitoring sponsored by PMCC where SSS and GSIS employees made surprise visits to hospitals caused a 20-30% decrease in the number of claims from these providers.</p> <p>According to Jeffers, fraud and abuse is common with any form of reimbursement insurance and he suggests that US experience with computer-based-procedures could help minimize these problems.</p>	<p>The present reimbursement formula creates incentives for abuse. Lack of physician manpower aggravated by additional work load due to decentralization prevents a thorough medical audit of claims. Moreover, the physicians are given little guidance on how to detect obvious cases of fraud.</p>	<p>Some reports of fraud and abuse such as claims made for beneficiaries who were not hospitalized reached the author.</p>	<p>"...low Operating Expenses (GSIS) experience is not necessarily good if the System is unable to aggressively deter frauds and abuses."</p>	
Claims Processing	<p>Claims processing of GSIS and SSS take as long as six months so it was considered too slow and furthermore, inadequate since it is not effective in stemming fraud and abuse.</p> <p>A computerized system and a data base should be set up in PMCC for auditing and research purposes.</p>	<p>Claims processing is currently not computerized. The development of an information system for utilization review, quality assurance and cost control is highly recommended. It was also noted that the eligibility of a member is not checked before the claim form is issued.</p>		<p>The author claims that it takes GSIS 5 to 6 months to process a claim while SSS takes only 30 days. It is this delayed processing of claims that is financially detrimental to service providers given high interest rates.</p>	
Program II	<p>Due to the existing problems of Program I, Program II is likely to have even greater difficulties.</p> <p>The most important concerns for Program II are: determining the capacity of low income earners to pay premiums, how to collect premiums, and how to make timely reimbursements.</p>	<p>Due to Ron's criticisms on the current benefit package, he does not recommend its adoption in the implementation of Program II. In addition, he recommends that decision on the basic benefit package has to be made (presumably to include primary health care) before the full scale Program II implementation.</p>	<p>The following were perceived by Solari as barriers to full implementation of Program II besides the pilot projects conducted by PMCC. 1)"There is little information about the size, characteristics, needs and financial capabilities of the Program II population," 2) it requires a more complex administrative set-up than Program I, 3) decision whether SSS or Program II should cover the self-employed may need legal action, and 4) Program I improvement is a prerequisite.</p>	<p>"...serious efforts are underway by DOH to systematically address the numerous and complex obstacles inhibiting Program II implementation."</p>	

paper is based mainly on working sessions with officials of the DOH and PMCC, interviews at the two social security systems (SSS and GSIS), and meetings with academies (UP) and donor agencies. He also reviewed the literature on the subject.

In contrast to the three earlier authors, Gamboa is a Filipino who, as an undersecretary of the DOH and head of the PMCC in behalf of then Secretary Alfredo Bengzon, has an insider's view of Medicare. His paper is an assessment of the health insurance industry in the country but dwells for the most part on Medicare. Aside from his experience as a public official, he extensively uses secondary data mainly from the PMCC and some national statistics to come up with his conclusions.

The next paper is actually a summary of Lague's 1988 masteral thesis at the Center for Research and Communications (CRC). The theoretical portion of his paper is included on the third page of Table 3. His conclusions in the empirical portion are not included in the table to avoid creating another column. The main purpose of his regression analysis is to find out whether there was a change in demand brought about by the implementation of Medicare and the Employees Compensation Commission (ECC). The result is that Medicare and ECC singly or combined does not affect demand for medical services.

Unfortunately, since the summary does not report standard errors (or t-values) and goodness-of-fit, the validity of his conclusions could not be ascertained. For example, it is possible that the equation for health care demand is underspecified (other explanatory variables could be included in the equation). One intuitive reason is that other factors are known to affect health care demand such as time costs, epidemics, etc. This author also doubts whether the piecewise linear regression and F-test are the most appropriate in testing for the effect of compulsory insurance on demand. Ordinary least squares and the usual test of significance on the dummy reflecting the presence of Medicare and ECC are simpler and adequate in detecting shifts in demand (Pindyck and Rubinfeld, 1981, pp. 111-16).

His equations also show that demand for medical care is income elastic (i.e., medical care is a luxury good) and price inelastic (i.e., huge changes in price will not greatly affect the quantity demanded). Therefore, price controls are ineffective in changing demand while insurance, which he assumes to affect disposable income, is effective. So, in spite of the fact that he found Medicare and ECC to be ineffective in increasing the demand for health care, he recommended that the government should not abandon compulsory health insurance as a means of making health care more accessible. The existing programs should be reformed to make them more effective.

The last two papers will be discussed in greater detail due to the bearing they have on the present study. The study by Griffin et al. (1985) is one of the most empirically based of the papers reviewed here. Aside from just using PMCC data and national statistics, the authors went the extra mile by being the first to look at the claims files available from the two systems. Although the authors did not discuss cross-subsidization (which is the focus of this paper), the data they presented demonstrated that cross-subsidies could be calculated.

Griffin et al. sought to describe the contribution and benefit structure of Medicare. The authors took a stratified random sample by region for GSIS and a simple random sample for SSS. Ironically, the SSS sample later proved to be more representative than the former. Claims made by the members in the sample for one year were included in the study.

The total number of members in the GSIS sample was 5,000, of which 1,077 made a total of 1,507 claims. Thus, the total claim rate per member was equal to 30% which is lower than the claim rate reported by the GSIS system. Average Medicare payment per claim was also lower than the actual figure, so that it was concluded that the sample results underestimate the true values. The sample for active SSS members was 8,360, of which only 662 claims were generated for a claim rate also lower than that reported by SSS. However, since the member/dependent ratio and average claims figures were close to the actual figures, it was concluded that the SSS sample was more representative of the population than the GSIS sample.

Results from the GSIS sample are reported in Table 4. The authors found that approximately the same number of members belonged to the different income quartiles created for the sample though the average age in each quartile was the same. Almost half of the total annual salaries came from the highest quartile and Medicare contributions as a percentage of income was on average only 0.01%. In contrast, the two lowest quartiles contributed 2.5-2.6% of income to Medicare. Medicare contributions as a tax were thus considered regressive. In spite of this fact, the proportion of total Medicare contributions was still highest for the upper two quartiles.

On the benefits side, the number of claimants was highest for the two lowest quartiles. But since the average value of claims was higher for higher income groups, the total value of claims was almost evenly distributed across quartiles. Thus, the authors concluded that "the system successfully provides payments according to need."

The lower portion of the table was added to clarify the above statement. Cross-subsidization merely compared the share of the income group to total contributions to their share in the value of

**Table 4**  
**MEDICARE CONTRIBUTIONS, BENEFITS, AND SALARY DISTRIBUTION WITHIN GSIS**  
**SAMPLE, PHILIPPINES, 1982**

	Quartile			
	1	2	3	4
Sample distribution (%)	25	25	25	25
Average annual salary (pesos)	3,754	6,136	8,314	17,202
% share in total salaries for sample	10.7	17.6	23.1	48.7
Average age	42	43	43	43
Total annual Medicare contributions	118,616	198,778	221,220	225,000
(% distribution)	(16)	(26)	(29)	(29)
Total Medicare contributions as % of total annual salaries	2.5	2.6	2.2	0.01
Total annual Medicare expenditures	80,506	86,066	77,985	78,715
(% distribution)	(25)	(27)	(24)	(24)
Total Medicare expenditures as % of total salaries	1.7	1.1	0.8	0.3
Ave. value of Medicare expenditures	202	205	211	258
Total no. of Medicare claims	399	419	370	305
(% distribution)	(27)	(28)	(25)	(20)
Cross-subsidization (% of contrib./% of expenditures)	0.64	0.96	1.208	1.28

Source: Griffin et al. (1985).

total Medicare claims or benefits. Whenever a group's share in total contributions exceeded its share in benefits, this group became a source of subsidy and vice versa. In 1982, the desired cross-subsidizations were achieved since the two lowest income quartiles were recipients of subsidy with the lowest income quartile receiving the greater amount while the two higher income quartiles were the sources of the subsidy. The ratios indicate that more subsidy came from the highest income quartile.

Unfortunately, a similar table for the SSS sample could not be constructed since the authors did not have much faith in the salary credits which are the only indicators of income in the membership files. Instead, the authors studied the sample in connection with disease patterns, average payment per charge category (i.e., room and board, drugs, physician's fee, etc.), and the breakdowns of the SSS claims among private and public hospitals and between urban and rural locations.

In terms of regional cross-subsidization, Griffin et al. found for both GSIS and SSS that 32.9 percent of members came from Manila but accounted only for 22.4 percent of total claims. Thus, they concluded that the Philippine case is unusual among low-income countries in that more Medicare contributions were drawn from the capital, thus contributing to the increases in medical infrastructure in rural areas.

Finally, Le Grand (1978) did not study the Philippine Medicare system but another compulsory insurance program with a radically different structure - the British National Health Service (NHS). For one thing, the NHS is funded from general taxes which are considered to be more equitable than payroll taxes. Further, there are no out-of-pocket costs required from patients in the NHS so that the cost of obtaining care is really just time and transportation costs, virtually eliminating financial barriers to medical care. And yet, Le Grand concluded that there are still inequities in the system by comparing the incidence of illness to the calculated expenditure by the NHS across socioeconomic groups (SEGs).

The incidence of illness was obtained through a General Household Survey (GHS) wherein households were asked about the occurrence of illness or injury (and its degree) in a two-week reference period. The percentage of people reporting long-standing and acute illnesses were presented in a table. Since differences in age and sex can drastically affect the distribution of morbidity, the percentages were standardized for age and sex. For both the original and standardized percentages, morbidity rates were higher for lower income groups though the variation is less with the latter.

Le Grand warned that, in calculating the public health expenditures for each group, several assumptions which are difficult to defend had to be made. Again, using the GHS, utilization data were obtained based on answers to questions concerning out-patient consultations and hospitalizations. Then, the per-patient cost of these services was calculated by taking the total cost of the NHS by type of service from published sources and dividing it by the total number of General Practitioners (GP) and hospital out-patient consultations and hospital in-patient days. These costs were then multiplied by the number of times each service was reported to have been used by the members of each SEG. Then the percentage of expenditures on each SEG to total was calculated. Again, standardized percentages were also presented.

The author concluded that inequities still occur in the NHS because the percentage of expenditures is higher than the percentage of those reporting illness for higher SEGs, professional groups, managers and those not engaged in manual labor. The opposite is true for SEGs engaged in manual labor (skilled, semiskilled and unskilled).

Since the cost of each unit of service was assumed to be constant through all the SEGs, the only sources of differences in expenditures were (1) differences on the incidence of disease, and (2) differences in utilization rates. Since it was found that disease patterns across SEGs were very similar, the latter explanation was adopted.



Several explanations were provided on the possible reasons why higher SEGs have higher utilization rates. It is more convenient for them since they (1) have cars and so are less reliant on public transport, (2) are more likely to have telephones and could thus easily make appointments, and (3) are more likely to reside in places where medical care is more accessible. Another possibility is that people from different SEGs are treated differently by medical personnel. Le Grand cited a study wherein people in higher SEGs spent longer time in GP consultation.

Finally, the author admits that due to the limitations of the data and some of the assumptions used, the results should not be considered conclusive but should be investigated further.

It would be interesting to see how Medicare would fare if morbidity rates were compared with Medicare expenditures across different income groups in the covered population. However, this is not possible using the secondary data available. Claim rates are not a very good proxy for morbidity rates since not all cases of hospitalization among the covered population are translated into claims.

To conclude this section, this paper differs from past studies on Medicare in that none of them focused on cross-subsidies and used the Computable General Equilibrium (CGE) experiment on the payroll tax. Most of the studies used secondary data and relevant national statistics. These papers, together with Gonzales et al.'s (1993) component study under the PIDS-DOH project, show that a lot has already been done in analyzing secondary data especially those consolidated by PMCC. Griffin et al. started the analysis of the claims files which is also used in this paper, and the only advantage which this paper has over the former is that it uses population statistics for GSIS. It is expected that other studies in the future will use the same database. Hopefully though, other studies will come up with the primary data necessary for the analysis of the effects of Medicare on consumer and provider behavior, areas where very little empirical work has been done in the past.

## IV. THE DISTRIBUTION OF MEDICARE CONTRIBUTIONS AND BENEFITS

Section III presented past studies on Medicare and some of the most important findings concerning the Program's different aspects. None of the papers however, focused on documenting which groups actually realized benefits from the Program nor did anyone dwell on the financial burden which the Program represents. This study attempts to accomplish these. But before making a presentation and an analysis of the results, data sources and problems should first be discussed. Then, cross-subsidization by income group, age group, gender, and regions will be explained. Finally, the section ends with a listing of future activities in the second phase of the component studies in Medicare that have relevance for this paper.

### Data: Sources and Problems

This paper updates the Griffin et al. study and attempts to improve on their data base. Taking advantage of the computerized and centralized membership and claims files of GSIS, the results are based on the 1.1 million active members in the membership file. Although the file was obtained in July 1992, not all of the income data for the members were uniformly updated. Some income data actually date back to the 1980s before the salary standardization law was implemented so that income figures are underreported.

For the second phase of the PIDS-DOH component studies on Medicare, several options will be explored on how to correct for this underreporting of income. One is to base income on the salary grade of the worker if data exist. The other option is to update presalary standardization incomes using a formula based on estimates of how government employees' incomes will change before and after the said law.

The claims files were not without their problems. In the period covered by the study (August 1991 to July 1992), the Medicare department actually used two systems, the PC-LAN and the mainframe. Fortunately, the former which had the majority of the claims contained the GSIS policy numbers necessary for the matching of the claims file with the membership file. Again, some claims were lost in the process of matching due to errors in either filling up the claim forms or in encoding. The study finally ended up with 220,337 matched claims (excluding retiree claims added in the subsidization by age group), or 37% of the estimated 600,000 claims filed in that period.

The main problem with the SSS membership file was its large volume. It is estimated that in 1992 7.8 million members (employees, the self-employed and employers) were in Region III<sup>5</sup> alone where the main office is located. Some 40% or 3 million members were considered "active." Since this is still roughly three times bigger than the GSIS population, only a sample of 872<sup>6</sup> randomly selected members were included in this study.

Only Region III was included in the study because SSS instituted a new claims system only in late February 1992 wherein they checked the SSS numbers of claimants before releasing checks to them. This system was first installed in Cebu and Davao in June, and later in the other regions too. Even for Region III, this author had to settle for the claims files over a six-month period (March to August 1992).

### Analysis of Results

#### 1. Cross-Subsidization by Income Groups

Results from the GSIS and SSS data are presented in Tables 5<sup>7</sup> and 6, respectively. GSIS membership was divided among four income groups. Members belonging to the first group have incomes below P2,000; for the second income group, incomes fall between P2,000 and P4,000; for the third group incomes must be between P4,000 and P6,000; and finally, the highest income group has members earning more than P6,000 monthly. We found out that 71% of the population belong to the first income group, 21% to the second; and the remaining 8% is shared by the two highest income groups. Household income would have been a better basis for calculating the cross subsidies. Unfortunately, it was impossible to make an estimate of household income given the membership files of SSS and GSIS.

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<sup>5</sup>SSS does not follow the usual Philippine regional groupings. It has only 10 regional offices, and the NCR happened to belong to the third regional office.

<sup>6</sup>The formula for sample size used is found in Cochrane (1977, p. 135). This author first obtained a preliminary sample of 94 SSS members and matched this with the claims. Assuming that the statistics from this preliminary sample are equal to population statistics, the values for the weight of each stratum, averages and variances required by the formula were obtained. The value of the sample size calculated was 551. The actual sample exceeds this number since it should be considered as a lower limit.

<sup>7</sup>Table 5 is different from that reported in seminars and in the draft final report. The earlier table underestimated contributions in the second to the fourth income groups so cross-subsidies were also underestimated. Contributions for later GSIS tables have not yet been corrected since cross-subsidies are not expected to change drastically for these tables as evidenced by Tables 2 and 3 in Appendix B.

Table 5  
INCOME, CLAIMS, CONTRIBUTIONS AND EXPENDITURE EXPERIENCE BY INCOME GROUPS, GSIS, 1991-1992

	Income Groups			
	I < 2,000	II 2,000 - 4,000	III 4,000 - 6,000	IV > 6,000
Number of Members	801,956	241,709	49,652	31,205
% of Total Members	71.32	21.49	4.42	2.77
Total Annual Income (Millions)	8,617.258	8,217.152	2,887.778	3,458.537
% of Total Annual Income	37.17	35.45	12.46	14.92
Average Annual Income	10,745	33,996	58,160	110,833
Total Annual Contributions (M)	215.431	145.025	29.791	18.723
% of Total Contributions	52.68	35.46	7.28	4.58
as % of Income	2.50	1.76	1.03	0.54
Total Medicare Expenditures (M)	246.543	67.154	15.580	10.881
% of Total Expenditures	72.48	19.74	4.58	3.20
Number of Claims	173,765	35,622	6,743	4,207
% of Total Claims	78.86	16.17	3.06	1.91
Average Value of Claims	1,419	1,885	2,311	2,586
Utilization Rate	21.67	14.74	13.58	13.48
Number of Dependents	124,759	24,967	4,578	2,850
% of Claims in Quartile	71.80	70.09	67.89	67.74
Cross-Subsidization (% of Contrib./% of Expenditures)	0.726	1.796	1.589	1.431

Total annual incomes and average annual incomes were computed for each income group. As in the Griffin et al. study, total Medicare contributions were calculated based on the reported annual salary of each member and using the Medicare premium contribution structure. It is assumed that the portion of the tax imposed on employers is simply passed on to the workers. As many authors in the past have pointed out, the contribution scheme is regressive since the tax rate (the tax as a percentage of income) decreases as income increases. The tax rate of the lowest income group is approximately equal to 2.5%.

As mentioned earlier, since not all of the claims could be included in the data set, the utilization rates (number of claims over number of members) in Table 5 are much lower than the reported utilization rates by GSIS. Utilization rates vary inversely with income while the average value of claims increases as income increases. The percentage of claims from dependents over the number of claims decreases as income increases, and this is plausible since lower income groups have more children and/or a higher incidence of illness.

Assuming that Griffin et al.'s sample is representative and that income values for the present data are accurate, the ratios for cross subsidization indicate that the current situation is worse than in 1985. Although the poorest income group still receives a subsidy, the primary source of the subsidy is the next income group which is another poor group. The highest income group which should have been the primary source of subsidy only ranks

third in terms of contribution for the benefit of the poorest group.

Again, it must be emphasized that there is reason to believe that the income data obtained were grossly underreported and that it is difficult to speculate how the cross-subsidies would change if these were corrected. However, a few facts shown in Table 5 concerning the characteristics of the GSIS membership remain unchanged, and most of these are supported by the findings of Griffin et al. Medicare contributions will remain regressive despite changes in income distribution. The value of Medicare claims increases as income increases, and poorer income groups make relatively more claims and more dependent claims than higher income groups.

Table 6 reveals a slightly different picture. Only three income groups could be constructed since the maximum monthly salary credit for social security contributions is P5,000 greatly understating the average income of the third income group. The income distribution is opposite that of GSIS with very few members belonging in the poor (I and II) groups. The percentage of Medicare contribution to income is lower than that of GSIS employees, with income group II having the lowest percentage. The reason for this is that the percentages depend not only on the

Table 6  
INCOME, CLAIMS, CONTRIBUTIONS AND EXPENDITURE  
EXPERIENCE BY INCOME GROUPS, SSS, (March-August 1992)

	Income Groups		
	I	II	III
Number of Members	96	454	322
% of Total Members	11.01	52.06	36.93
Total Income (March-August 1992)	763,613	9,086,414	9,433,870
% of Total Income	3.96	47.12	48.92
Average Monthly Income	1,326	3,336	4,883
Total Contributions	5,742	52,668	68,248
% of Total Contributions	4.53	41.58	53.88
as % of Income	0.75	0.58	0.72
Total Medicare Expenditures	9,982	39,946	74,141
% of Total Expenditures	8.05	32.20	59.76
Number of Claims	3	12	27
% of Total Claims	7.14	28.57	64.29
Average Value of Claims	3,327	3,329	2,746
Utilization Rate	3.13	2.64	8.39
Number of Dependents	0	6	19
% of Claims in Income Group	0.00	50.00	70.37
Cross-subsidization (% of Contrib./% of Expenditures)	0.563	1.292	0.902

level of income but on the consistency of paying the contributions as well. Members in income group II (or their employers) probably

are less conscientious in paying their contributions. This lower percentage of income going to Medicare should be considered in plans to merge the two health insurance funds (HIF). Although in sheer number, the SSS HIF is larger and has more reserves due to low utilization rates, GSIS employees may still be disadvantaged since the contributions they make take up a greater percentage of their income. Otherwise, measures should be taken to address the habitual practice of employers of making irregular payments to SSS.

Values of cross subsidies indicate that the second income group subsidizes the lower and higher income groups. A concern specific to SSS is the alarmingly low utilization rate among low income groups. It is thus suggested that a study be made to ascertain the reason for this so that proper action could be taken to address it since it is the poor who are more in need of the safety net provided by Medicare. A related study could look into the reasons for the greater utilization rate in GSIS.

For both the GSIS and SSS, in spite of the fact that no definite conclusion can be made due to the problems with the income data, the numbers do indicate the importance of designing a contribution and benefit structure which will ensure that the poor will benefit more from the program at the expense of the rich.

## 2. Cross-subsidization by Age Groups

Tables 7 and 8 are results for cross-subsidies across age groups. For both systems, age is based on the year of birth of the member. Since morbidity rises as age increases it was expected that younger members would subsidize their elders. It is a foregone conclusion that retirees would receive subsidy since they are not required to pay contributions anymore. For GSIS, retirees account for only less than 10% of total Medicare expenditures when retirees in the PC-LAN system are combined in the matched file. A processing of all the claims from March to August 1992 shows that approximately 1.3% of all SSS claims come from retirees, indicating that retirees do not represent yet a great burden to the contributing members in both systems.

The same pattern of cross-subsidization (original) could be found in GSIS and SSS. The youngest group and members aged 45-65 were subsidizing the retirees and members aged 26-45. This pattern could be explained by the number of dependent claims per group. Aside from morbidity rates it should be considered that people tend to get married and have children between the ages of 25 and 45. It is expected that at this age range, there would be a higher incidence of dependent claims due to the higher incidence of

Table 7  
INCOME, CLAIMS, CONTRIBUTIONS AND EXPENDITURE EXPERIENCE BY AGE GROUPS, GSIS, 1991-1992

	Age Groups			
	< 26	26 - 45	45 - 65	Retiree
Number of Members	21,224	728,775	374,523	
% of Total Members	1.887%	64.808%	33.305%	
Total Annual Income	533,988,828	14,154,936,779	8,491,799,480	
% of Total Income	2.304%	61.063%	36.633%	
Average Annual Income	25,160	19,423	22,674	
Total Annual Contributions	10,009,619	260,562,001	140,685,737	
% of Total Contributions	2.434%	63.357%	34.209%	
% of Annual Income	1.874%	1.841%	1.657%	
Total Medicare Expenditures	3,112,715	241,059,218	95,985,654	32,754,645
% of Total Expenditure	0.835%	64.642%	25.739%	8.783%
Number of Claims	1,727	156,268	62,342	22,057
% of Total Claims	0.712%	64.469%	25.719%	9.100%
Average Expenditure	1,802	1,543	1,540	1,485
Utilization Rate	8.137%	21.443%	16.646%	
Number of Dependents	1,121	115,638	40,395	12,558
% of Claims in Age Group	64.910%	74.000%	64.796%	56.934%
Cross-subsidization (Original) (% of Contrib./% of Expenditures)	2.92	0.98	1.33	0.00
Cross-subsidization (Members Only)	2.48	1.13	1.13	0.00

Table 8  
INCOME, CLAIMS, CONTRIBUTIONS AND EXPENDITURE  
EXPERIENCE BY AGE GROUPS, SSS, MARCH-AUGUST 1992

	Age Groups			
	< 26	26 - 45	45 - 65	Over 65
Number of Members	126	555	191	
% of Total Members	14.450%	63.647%	21.904%	
Total Income (Mar-Aug '92)	2,229,793	12,537,561	4,516,543	
% of Total Income	11.563%	65.016%	23.421%	
Average Monthly Income	2,949	3,765	3,941	
Total Contributions	15,498	84,166	26,993	
% of Total Contributions	12.236%	66.452%	21.312%	
% of Total Income	0.695%	0.671%	0.598%	
Total Expenditures	9,663	94,384	20,023	1,775
% of Total Expenditure	7.678%	75.001%	15.911%	1.410%
Number of Claims	4	29	9	1
% of Total Claims	9.302%	67.442%	20.930%	2.326%
Average Expenditure	2,416	3,255	2,225	1,775
Utilization Rate	3.175%	5.225%	4.712%	
Number of Dependents	2	19	4	
% of Claims in Age Group	50.000%	65.517%	44.444%	
Cross-subsidization (Original) (% of Contrib./% of Expenditures)	1.59	0.89	1.34	0.00
Cross-subsidization (Members Only)	1.27	1.02	0.96	0.00

maternity claims,<sup>8</sup> and relatively high morbidity rates of young children.

Cross-subsidization of members only was obtained by deducting the value of dependent claims from total Medicare expenditures per age group. The values obtained were consistent with inter-generational transfers implicit in any social security setup, i.e., benefits for the older generation are partly paid for by contributions from the younger generation, who, in turn expect that the generation after them will also contribute for their benefit when they get old. In the case of GSIS Medicare, all contributing members subsidized the retirees, but in the case of SSS Medicare, a member could expect to be subsidized upon reaching the age of 45. The reason for the difference is that SSS retirees rarely take advantage of their Medicare benefits. One factor to consider is that the SSS extended Medicare coverage to retirees (and their dependents) only in 1990, while the GSIS had done so as early as 1974. Moreover, GSIS utilization rates are historically higher than those of SSS.

### 3. Cross-Subsidization by Gender

Tables 9 and 10 provide an indication of cross-subsidies by gender. This is where GSIS and SSS patterns are very dissimilar. The data indicate that at GSIS females subsidize the males even

Table 9  
INCOME, CLAIMS, CONTRIBUTIONS AND EXPENDITURE EXPERIENCE BY GENDER, GSIS, 1991-1992

	Male	Female	Total
Number of Members	588,684	535,838	1,124,522
% of Total Members	52.350%	47.650%	
Total Annual Income	11,381,335,197	11,799,389,890	23,180,725,087
% of Total Income	49.098%	50.902%	
Average Annual Income	60,410	75,187	
Total Annual Contributions	202,299,619	208,957,741	411,257,360
% of Total Contributions	49.191%	50.809%	
% of Annual Income	1.777%	1.771%	
Total Medicare Expenditures	191,962,084	180,950,149	372,912,233
% of Total Expenditure	51.476%	48.524%	
Number of Claims	130,502	111,892	242,394
% of Total Claims	53.839%	46.161%	
Average Expenditure	1,471	1,617	1,538
Utilization Rate	22.168%	20.882%	21.555%
Number of Dependents	96,410	73,302	169,712
% of Claims	73.876%	65.511%	
Cross-Subsidization	0.96	1.05	

<sup>8</sup>Actually, Obstetrical-Gynecological cases as a percentage of the number of claims is highest for the 46-65 age group but is followed closely by the 26-45 age group with 1.15%. The value for the youngest group is .75% and for retirees, .12%. The actual number of maternity cases is unknown.



Table 10  
 INCOME, CLAIMS, CONTRIBUTIONS AND EXPENDITURE  
 EXPERIENCE BY GENDER, SSS, MARCH-AUGUST, 1992

	Male	Female	Total
Number of Members	573	299	872
% of Total Members	65.711%	34.289%	
Total Income (mar-aug 1992)	12,832,853	6,451,043	19,283,896
% of Total Income	66.547%	33.453%	
Average Monthly Income	3,733	3,596	
Total Contributions	83,077	43,580	126,657
% of Total Contributions	65.592%	34.408%	
% of Total Income	0.647%	0.676%	
Total Medicare Expenditures	61,660	62,409	124,069
% of Total Expenditure	49.698%	50.302%	
Number of Claims	23	19	42
% of Total Claims	54.762%	45.238%	
Average Expenditure	2,681	3,285	2,954
Utilization Rate	4.014%	6.355%	4.817%
Number of Dependents	18	7	25
% of Claims	78.261%	36.842%	
Cross-Subsidization	1.32	0.68	

though the subsidy is very small, while at SSS, males subsidize the females. The opposite results may be the outcome of the difference in the sex and income structure of the two systems. At GSIS the ratio of males to females is almost 1:1, while at SSS it is 3:1. The reason for the disproportionate number of males over females in the SSS membership could be the higher proportion of females employed in the informal sector or in occupations not covered by Medicare.

Another difference is that females have slightly higher average earnings than males in GSIS while males have higher incomes than females in SSS. It is not clear, however, whether the former result is due to more recent updating of income among females than males.

#### 4. Cross-Subsidization by Regions

Since data from SSS were taken from only one region, regional cross-subsidies presented in Figure 1 are only for GSIS. It must be made clear that the regions designated in Figure 1 are not the usual regional groupings we know of. The reason for this is that the GSIS membership file does not indicate the regional location of the member but only indicates the GSIS regional office to which the member belongs. The problem is that GSIS regional offices are not always responsible for provinces within the same region. Thus, the regional groupings given in Figure 1 must be considered as approximations. A list of the GSIS regional offices and the provinces under their jurisdiction is provided in Appendix A. Furthermore, the offices enumerated under NCR have employees

scattered across the country which means that number of members reported in the NCR is higher than the number of members actually residing in the NCR.

The regions in Figure 1 are arranged according to the value of the ratio between share in contributions to share in benefits. The graph shows that only four regions have ratios greater than unity. These are the NCR and Regions VIII, III and I. Since the ratio is almost equal to one for Regions III and I, then the subsidy mostly comes from the NCR and Region VIII. Region VIII is a puzzle since the provinces listed under this region are Samar and Leyte which are very poor provinces. Generally, it is considered favorable for the NCR which is the wealthiest region in the country to subsidize the other regions. In spite of the fact that the average value of claims is highest for the NCR and Region III (which is to be expected since higher level facilities and more specialized manpower are concentrated there) these two regions are net subsidizers. The utilization rate or number of claims over number of members per region was also plotted in the same graph. There is an inverse relationship between utilization rate and the ratio. The regions which are receiving the greatest subsidy are also the regions which have the highest utilization rates.

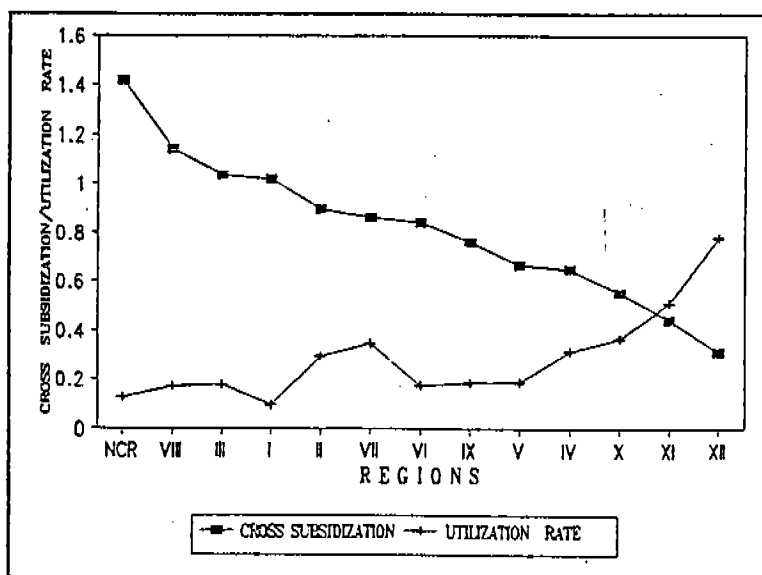


Figure 1. Cross Subsidization Across Regions

Therefore, given all the above considerations, whether the present cross subsidization between regions is desirable depends on the reasons for the variation in the utilization rates across regions. Thus, it is highly recommended that a study be made concerning the high variation of utilization rates between regions which is beyond the scope of this study. For starters though, an interview with the head of the Programs Development Staff of PMCC revealed that the following are the provinces where fraud has been detected:

1. Davao (Region XI)
2. Sultan Kudarat (Region XI and XII)
3. Bukidnon (Region X)
4. Bohol (Region VII)
5. Quezon (Region IV)

6. Misamis Oriental and Occidental (Regions IX and X)
7. NCR (NCR)

The provinces are arranged from highest to lowest incidence of fraud and the regions where each province belongs (using the regional groupings in Appendix A) is indicated. It is interesting to note that the top three offenders happen to have the highest utilization rates and are primary recipients of subsidy. It is difficult to speculate how fraud affects the values of the cross subsidies though this author suspects that even in the absence of fraud, the NCR will still end up subsidizing the other regions.

#### 5. Regression Analysis of Cross-Subsidies

So far, the analysis of cross-subsidies within the Medicare population has been made through cross-tabulations. This type of analysis indicates that there are inequities in the present system. Furthermore, other important issues were raised like the low utilization of benefits by low income SSS members and the problem of fraud and abuse in some regions in the country.

This part deals with the regression analysis of cross subsidies which provides a more rigorous test on the existence of cross-subsidies among the different groups within the covered population. Exactly the same data will be used for SSS, and a sample of 2,000 members stratified by regions will be used for GSIS. A sample had to be used for the latter due to limitations on the volume of observations which could be processed using PC-based statistical software packages. Comparable tables for GSIS (Tables 5, 7, and 9) are presented in Appendix B. A comparison of the population and sample statistics (especially the percentages and averages) indicates that the sample obtained is representative of the population.

The specification of the regression equation is:

$$C = y\beta + e \quad \text{and}$$

$$y = [1, I_1, I_2, \dots, I_{16}, A_1, A_2, S, R_1, R_2, \dots, R_{12}]$$

where

C = cross subsidy ratio

I = income groups

A = age groups

S = sex

R = regional groups

The dependent variable, C, is a dummy variable such that

$$C = \begin{cases} 1 & \text{if benefits/contribution} > 1 \\ 0 & \text{otherwise} \end{cases}$$

C takes on the value of 1 when the ratio of benefits to contribution exceeds one, indicating the observation is a recipient of subsidy. Otherwise, C = 0 for observation who are sources of subsidy. Since the dependent variable is binary, the logit model was used. A significant positive coefficient in any explanatory variable indicates that the group is a significant source of subsidy and vice versa. Insignificant coefficients indicate that no definite conclusion could be made on whether the group is a recipient or a source of subsidy.

The first explanatory variable, I for income, was divided into 17 groups based on the Medicare premium contribution structure. Thus,

$$\begin{aligned} I1 &= \begin{cases} 1 & \text{for monthly incomes} < 150 \\ 0 & \text{otherwise} \end{cases} \\ I2 &= \begin{cases} 1 & \text{for monthly income } 150 - 199.99 \\ 0 & \text{otherwise} \end{cases} \\ &\vdots \\ I16 &= \begin{cases} 1 & \text{for monthly income } 4250 - 4749.99 \\ 0 & \text{otherwise} \end{cases} \end{aligned}$$

The dummy for age groups follows the categories found in Tables 7 and 8:

$$\begin{aligned} A1 &= \begin{cases} 1 & \text{for ages } 26 - 45 \\ 0 & \text{otherwise} \end{cases} \\ A2 &= \begin{cases} 1 & \text{for ages} > 45 \\ 0 & \text{otherwise} \end{cases} \end{aligned}$$

The dummy for sex is as follows:

$$S = \begin{cases} 1 & \text{if male} \\ 0 & \text{if female} \end{cases}$$

And finally, the regional dummies follow the CSIS regional groupings:

$$R1 = \begin{cases} 1 & \text{for Region I} \\ 0 & \text{otherwise} \end{cases}$$

R2 = 1 for Region II  
0 otherwise

.

.

.

R12 = 1 for Region XII  
0 otherwise

The results of the regression analysis are presented in Tables 11 and 12 for GSIS and SSS, respectively.

For the GSIS sample, the results are disappointing for the income dummies since none turned up with significant coefficients. Income dummies 1 to 10 belong to income group I, 11 to 14 to income group II, and 15 and 16 to income group III. Most observations in income dummy 17 (which are not included in the equations) belong to the fourth income group. Aside from not having significant coefficients, the signs are mixed in each income group. Thus, no definite conclusions can be made concerning cross-subsidies by income groups in the GSIS sample.

None of the age dummies are significant either, though the signs are consistent with the results from Table 7. Surprisingly, the sex dummy is significant at the 1% level in spite of the fact that the ratio of cross-subsidies in Table 9 for males and females is close to one.

Table 11  
LOGIT OPERATION ON THE GSIS DATA

Variable	Coefficient	t-ratio of X
Constant	0.63186E-01	0.633
I1	-0.10234	-1.249
I2	-0.62099E-01	-0.742
I3	-0.78065E-01	-0.933
I4	-0.38419E-01	-0.648
I5	0.12146E-01	0.224
I6	0.51188E-02	0.096
I7	0.44958E-02	0.083
I8	0.66284E-02	0.123
I9	0.26997E-01	0.489
I10	0.39036E-01	0.689
I11	-0.96814E-02	-0.183
I12	-0.17583E-01	-0.302
I13	0.70383E-02	0.128
I14	0.19922E-01	0.254
I15	-0.83876E-01	-0.900
I16	0.26973E-01	0.453
AG1	0.43220E-01	0.486
AG2	-0.77058E-02	-0.086
SEX	0.62127E-01	3.423*
R1	0.65776E-01	1.389
R2	0.67907E-01	1.424
R3	-0.44447E-02	-0.104
R4	0.17820	3.938*
R5	0.18403	4.315*
R6	0.71635E-01	1.455
R7	0.74912E-01	1.988*
R8	0.55391E-01	1.198
R9	0.16301	3.583*
R10	0.21405	5.397*
R11	0.29281	6.826*
R12	0.43730	8.236*

\* Significant at the 5% level

The results for the regional cross-subsidies generally support the findings from Figure 1. In fact, the coefficients for the regions with the highest utilization rates are significant at the 1% level with positive signs. Needless to say, if a dummy for the NCR is included in the equation, the coefficient would be significant and negative in sign. The sign of the coefficient for Regions I and VIII is

opposite that expected from Figure 1. Anyway, cross-tabulation values of cross-subsidy for these regions are close to one.

The SSS regression results, of course, have no dummies for regions since the sample was obtained from Region III (Main Office) only. For the age and sex dummies, the results are not significant, but again, the signs are consistent with the findings from the cross-tabulations. For the income

dummies, a look at the signs of the coefficients also indicates inequity. The only significant sources of subsidy at the 5% level are income groups 13, 14 and 15 with monthly incomes ranging from P2750 to P4249.99. As it turned out, when the highest income group was included in the equation with income group 14 left out of the equation, the coefficient was

positive with a t-statistic equal to 2.02, significant at the 10% level. This indicates that the highest income group (for incomes greater than or equal to P4750 a month) is the only group which is significantly receiving subsidy.

Generally, the regression results support the findings from the cross-tabulation especially the signs of the coefficients. Unfortunately, most of the coefficients did not turn out to be significant even at the 10% level. All of the above results must be considered preliminary due to the said problems on data. Thus, for Phase II of the Medicare studies efforts will be made to correct the underreporting of GSIS income and to obtain nationwide data for SSS. In the long run though, data from a primary survey with the household as the unit of observation may be more revealing than GSIS and SSS records. Improvements on the regression techniques used here may also be necessary.

Table 12  
LOGIT OPERATION ON SSS DATA

Variable	Coefficient	T-Stat.
C	-2.5314103	-4.7694566**
I1	-3.5850867	-0.3752933
I2	-3.5333769	-0.3711812
I3	-3.9500878	-0.4145603
I4	-4.1286530	-0.3057498
I5	-3.8249576	-0.6965501
I6	-3.5175521	-0.5262321
I7	-3.6672018	-0.8610025
I8	-3.6499170	-0.7696990
I9	0.4019239	0.3647320
I10	-3.6340465	-1.1106103
I11	-1.1663878	-1.1284843
I12	-1.5120497	-1.5019376
I13	-1.7337284	-2.4052817**
I14	-1.4988602	-2.0276675**
I15	-1.4859441	-2.4175995**
I16	-0.8817430	-1.1505385
AG1	-0.1705041	-0.2057282
AG2	0.4603773	0.9764392
SEX	-0.3847732	-1.0083470

\*\* Significant at the 5% level

## V. THE EQUITY AND EFFICIENCY OF MEDICARE FINANCING

In the preceding section, to make the discussion simpler, it was assumed that the worker pays for the total Medicare premium. In fact, all of the past studies on Medicare cited in Section III implicitly assume this. The common thread running through the authors' comments is that the wage ceiling is the regressive feature of the contribution scheme. As shown in Table 5, contributions approximately equal 2.5% of the annual salary of lower income groups but the tax rate declines as incomes increase.

However, in the economic theory of tax incidence, one cannot simply assume that the employee pays all of the tax or that the legal incidence of the tax is equal to economic incidence. Economic incidence analysis is still required because, often, the legal incidence is misleading. For example, the legal incidence of the Medicare payroll tax falls equally on the employer and employee. It is generally agreed that the employee's share of the tax is shouldered completely by the workers due to their inability to pass on the tax to other sectors. The employers share, on the other hand, could be shifted forward or backward.

Forward shifting means that when employers are faced with higher labor costs they try to pass these on to consumers by raising the prices of their product. In this manner, profits are kept at their pretax levels. Lower profits after tax, other things held constant, indicate that employers shouldered all or part of the tax.

When the employer's share of the tax is passed on to the workers, we call it backward shifting. Backward shifting is present when after-tax wages fall. When there is labor mobility, even laborers in the untaxed sector may be affected.

There are two ways of conducting the economic incidence of the tax in the general equilibrium context. The traditional approach is exemplified by the study made by the Joint Executive-Legislative Tax Commission on the social security tax. Given theoretical considerations and what is known about the structure of the economy, i.e., the elasticities of demand and supply of labor and commodities, "shifting assumptions" are made on the distribution of the burden of the tax. For example, the study assumed that the employees bear the full burden of their share of the tax. Some 50% of the employer's share is passed on to consumers while the balance is shared equally by the employers and workers. The final distribution of the tax among the different income groups in the economy is calculated based on each household's share in labor

income, profit income and consumption of goods produced in the taxed sector. The end result was that the tax is regressive but the tax rate increased for the higher income groups due to the assumption that 25% of the employer share was absorbed by profit income.

Shah and Whalley (1991) are not very confident about the results of these types of studies because (1) the results are sensitive to the shifting assumptions made which, admittedly, are arbitrarily chosen; and (2) some structural features in developing countries may be overlooked. For example, when rural-urban migration is present, agricultural workers may bear part of the burden of the tax through a decrease in wages in general. The above analysis could not address this issue.

Shah and Whalley therefore concluded that numerical general equilibrium models should replace the implicit models that underlie past studies on incidence because, at least in the latter, the model and production and demand elasticities are explicitly presented.

Present CGE models are the result of a theoretical problem posed by Leon Walras in the nineteenth century.<sup>9</sup> At that time, Walras created the most mathematically elaborate general equilibrium model which outlined the workings of an economic system. The model is composed of interdependent markets where price is determined by demand and supply and economic decisions are based on prices. The problem posed by Walras was, whether the prices that will clear all markets exist, i.e., demand equals supply in all markets.

Theoretically and mathematically, the existence problem was proved in the period 1940s-1950s through the work of Arrow and Debreau among others. Two decades later, advances in mathematical techniques and computer technology gave rise to applied general equilibrium or CGE models which finally proved that the numerical solution to large general equilibrium models actually exists.

Lately though, the interest in CGE models has not been for the purpose of theory, or of proving the existence problem but for applying the solutions to real life policy questions. Traditionally, CGE models are used to analyze the effects of a change in economic policy, e.g., the imposition of a tax or tariff, or the effects of exogenous shocks, e.g., an increase in the price of imported oil. The usual CGE experiment consists of getting "benchmark" values for important parameters, then recalculating the same parameters given the change in policy. The two sets of values

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<sup>9</sup>This history on the CGE model is based on Scarf and Shoven (1984, pp. ix-xi).



are then compared to trace the effects on prices, output levels, government revenues, and the distribution of income.

However, some apprehension is felt by economists and statisticians on the use of CGE modelling for policy application.<sup>10</sup> At the most basic level, the reliability of the results is being questioned due to several problems: (1) consistent and reliable data are hard to come by, which is why calibration has to be performed; (2) many key parameters such as elasticity estimates have to be chosen among sometimes conflicting values; and (3) many aspects of model design reflect the subjective biases of the modeler.

This writer would like to take the conservative view that although CGE results are good inputs in policy-making, they are not to be used as the sole basis for the precise numbers which the policy should take. Many modelers emphasize "broad themes" rather than precise numbers. Thus, specifically, the CGE model results used in this paper will be compared with the results of the cited work on the payroll or social security tax. The following hypotheses will be tested:

1. The payroll tax is regressive.
2. The tax is passed on to consumers.
3. The tax is passed on to laborers.

There are several computable general equilibrium (CGE) models for tax incidence analysis already in existence for the Philippines, and the one chosen for this study is the Clarete model, which is one of the latest and largest CGE models for the country today. The theoretical structure of this model is provided in Appendix B. One of the advantages of using this model is that it does not rely on past estimates of the behavioral parameters or elasticities that have been one of the problems associated with constructing a CGE model. It uses the estimates from a project to construct another CGE model called APEX wherein the estimation of the behavioral parameters is part of the project. Since the estimations are based on the same data set, they at least provide a consistent structure for the whole model.

The Clarete model uses the 1989 data set for production, consumption, taxes and income distribution. It was already calibrated to reconcile all the data from the supply and demand sides. Additional calibration had to be done in order to incorporate the Medicare tax in the model. The calibration assumptions and results are presented in Appendix C.

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<sup>10</sup>Problems in the use of CGE in policy analysis are based on Whalley (1985, pp. 25-26).

As in usual CGE experiments, the model was run twice, first to get equilibrium values for the benchmark income, output and prices without the payroll tax, then run again to get after-tax values. It was assumed that the government spends all the tax revenues on subsidies on consumption of medical care as a fixed percentage of medical expenditures of each income group.

The major effects of the payroll tax are presented in Figure 2, and numerical results are summarized in Tables 13 to 15. One of the major effects of the tax is to increase the cost of labor in production. Tables 13 and 14 show that the higher cost is absorbed by profit income. Suppliers in the model could not simply increase prices to pass on the higher costs to consumers due to the assumption in the model that consumers can easily shift to importables, making their demand elastic. Lower profits lead to

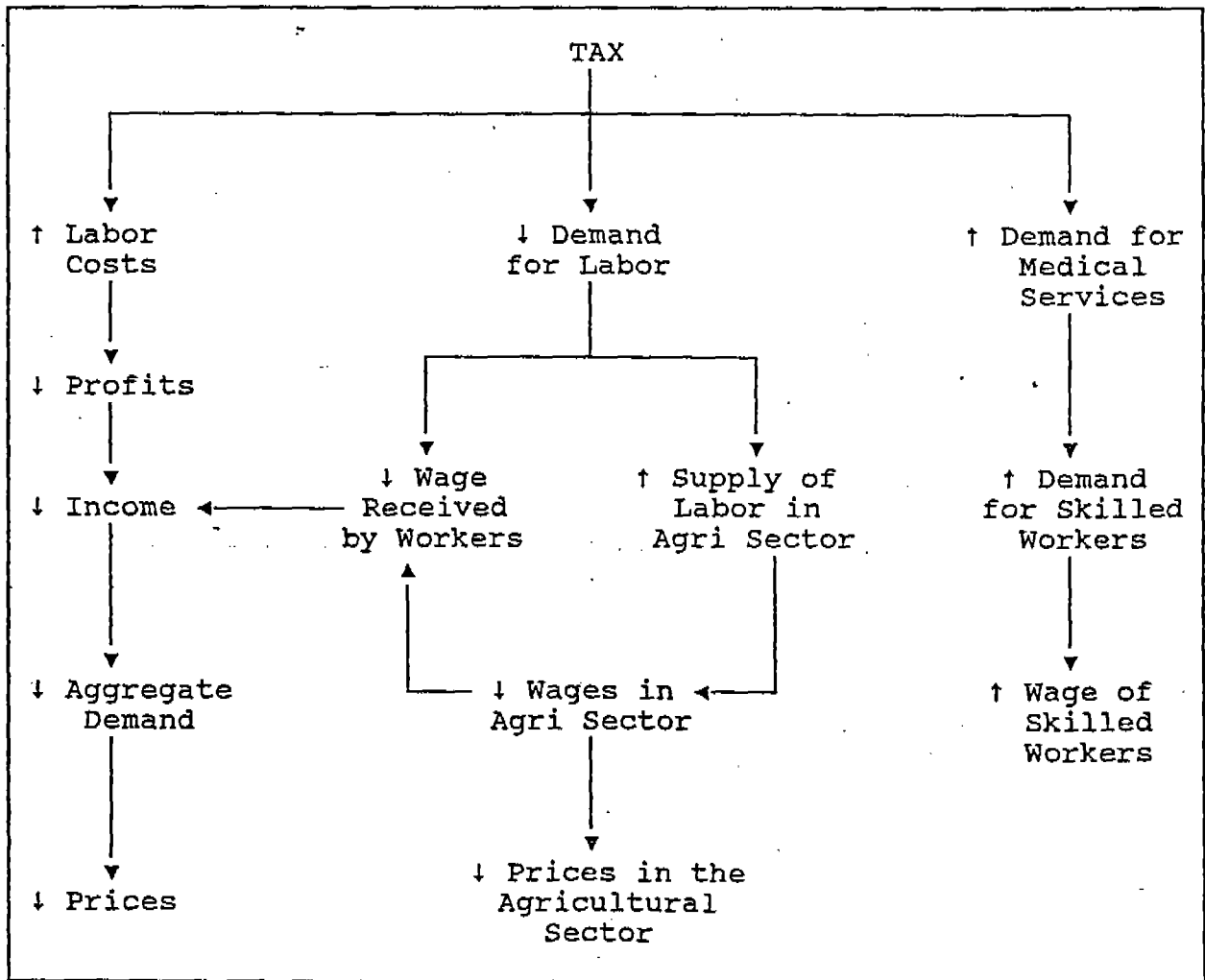


Figure 2. Schematic Diagram of Effects of the Payroll Tax

lower income, lower aggregate demand and lower prices for goods as seen in Table 13.

Table 13  
PERCENTAGE CHANGE IN OUTPUT, PRICES AND UNIT PROFITS

	Percent Change in		
	Output	Prices	Profits
Palay	0.004	-0.104	-0.089
Corn	0.006	-0.108	-0.088
Coconuts and Copra	0.022	-0.129	-0.046
Sugarcane	-0.020	-0.124	-0.177
Fruits and Vegetables	-0.031	-0.131	-0.307
Other crops	0.021	-0.052	0.044
Hogs	-0.054	-0.181	-0.605
Chicken and Eggs	0.170	0.180	0.854
Other Livestock	0.069	0.055	0.467
Fishery	-0.038	-0.139	-0.351
Mining, Forestry	0.018	-0.021	-0.293
Milling	-0.017	-0.082	-0.447
Food, Beverages and Tobacco	-0.055	-0.049	-0.604
Textiles	-0.043	-0.010	-0.709
Wood Products	0.083	0.034	-0.157
Fertilizer	0.009	-0.011	-0.283
Coal	-0.028	-0.021	-0.350
Metal Industries	0.032	-0.022	-0.162
Conductors	-0.026	-0.008	-0.651
Machineries	-0.036	-0.004	-0.538
Rubber, Plastic, Chemicals	0.002	-0.009	-0.358
Construction	-0.061	-0.015	-0.632
Trading	0.004	-0.006	-0.243
Financial Services	0.030	0.095	0.149
Government and Other Services	0.030	0.064	-0.858

Another major effect of the tax is to decrease the wages received by the workers due to a decrease in demand for labor which is also linked to lower incomes, lower aggregate demand and lower prices. Since the tax falls mainly in the manufacturing sector, lower demand for labor in that sector releases more labor in the agricultural sector, causing a further decrease in wages especially of unskilled labor. One further effect is a lowering of labor costs in the agricultural sector, causing a decrease in the price of agricultural outputs.

Table 14  
PERCENT CHANGES IN FACTOR PRICES

Factor	Change
Unskilled Labor	-0.158
Skilled Labor	0.029
Capital	-0.160
Land	-0.087

The wedge created by the tax between what employers pay workers and the amount received by workers is captured by the government. However, it is assumed in the model that all the revenues are spent as a subsidy on medical services distributed proportionately according to the medical expenditures of each income group which contributes to the overall regressiveness of the tax since the rich spend more on medical services. The rationale behind this assumption is that the majority of the poor are not covered by Medicare anyway. On a small scale, there will be an increase in the demand for medical personnel who are skilled laborers. Other minor effects of the tax are excluded from the diagram. Since this is a standard CGE model, the effects of improved health on productivity are ignored. However, a planning model which incorporates the effect of health on national development is being developed under the PIDS-DOH Project.

In Table 13 we see a mixed effect on output but definitely a negative effect on prices and profits. Overall, the effect of the payroll tax is small, and the numbers in the tables are already in percentage terms so the tax has a smaller than 1% effect on all values.

Looking at changes in prices, there seems to be a larger effect on the agricultural sector than on the manufacturing sector. Although aggregate demand plays a role, the decrease in the cost of unskilled labor seems to be the more important factor to consider. The effect of the tax on the exchange rate is difficult to assess since the exchange rate is the numeraire<sup>11</sup> for the model.

In Table 12, the increase in wages for skilled labor seems to contradict what is presented in Figure 2. However, it must be noted that outputs hardly changed in the manufacturing sector (the positive and negative values net each other out) and that the decrease in prices is very small. Demand for skilled labor is also relatively inelastic compared with unskilled labor, and the small increase in demand for medical personnel may have led to the small increase in wages for skilled labor.

Summing up all the effects of the tax in terms of changes in income, Table 15 shows that the tax is regressive since the decrease in income decreases as income increases. So, to recapitulate, we found out through the CGE experiment that:

1. the tax is uniformly regressive across all income groups,
2. the tax was absorbed by profit income and was not passed on to consumers, and

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<sup>11</sup>It was recognized even by Walras that the existence of equilibrium prices required that one price should be set as the numeraire which is always equal to one. The numeraire is necessary so that the number of prices (unknowns) would equal the number of independent equations.

3. unskilled laborers including those in the agricultural sector suffered a decrease in wages.

Table 15  
CHANGES IN INCOME PER QUINTILE

Quintile	Benchmark income	After tax income	Percent change
HH1	53.3188	53.2304	-0.166%
HH2	85.4098	85.2755	-0.157%
HH3	119.024	118.848	-0.148%
HH4	174.298	174.067	-0.133%
HH5	337.25	336.815	-0.129%

The model can provide a measure of deadweight loss. This measure is based on the difference between the changes in the utility of income of each household and of the government. However, since this involves the assumption that interpersonal utilities can be added, which is considered questionable by many economists, all results based on this assumption are not presented. Suffice it to say that the tax is associated with a deadweight loss since it distorts the relative price of labor vis-a-vis other factor prices which is another source of inefficiency in the economy. Another evidence of the presence of the deadweight loss is the decrease in income experienced by all income classes.

Actually, there are some people who will argue that the deadweight loss is overstated by the CGE model or that it does not exist at all. Workers are willing to pay the Medicare contribution because it actually represents a purchase of a product that provides some form of utility for the consumer. This utility is the security felt by the worker when he considers that Medicare can help him pay for medical bills when the need arises. Unfortunately, it is very difficult to measure the utility derived from being covered by Medicare so that it is not easy to make a statement on whether the marginal cost of purchasing this health insurance is equal to the marginal utility derived from it. However, some observations indicate that this is not the case. First, for those who can afford it, additional health insurance could be purchased. Second, some HMOs in the market offer more benefits at premiums comparable to the Medicare contributions. Third, there are people who are aware of the benefits but do not claim them anyway. As long as people would opt not to purchase Medicare if given a choice between Medicare or no Medicare or between Medicare and some other health insurance, then some negative utility is associated with paying the Medicare contributions.

Foreign studies/articles point out that the income tax is more efficient and equitable than payroll taxes. This may be true in developed countries but this ignores the fact that in many developing countries, the prime example of which is the Philippines, tax evasion is so rampant that income taxes may even prove to be more regressive than the payroll tax. Indirect taxes, on the other hand, are the best examples of the tradeoff between the equity and efficiency of taxes. Taxes on necessities are efficient but regressive. "Sin" taxes are in a different category since a decrease in the consumption of cigarettes and alcoholic beverages is one of the desired outcomes of the tax.

In the final analysis, the payroll tax has many things going for it, even assuming that the deadweight loss exists. Traditionally, social security benefits are financed through this tax not only in the Philippines but worldwide. It provides a stable source of funds for the program. All the administrative structures necessary for its collection, investment and disbursement have been established. People are already used to it, so that one hardly hears a protest against it. Presently, with the country's huge budget deficit and the executive and legislative branches of the government desperately trying to find new sources of revenues, it will be very difficult to find another tax which will be both more efficient and equitable than the Medicare contribution. What could perhaps be done in future researches is to compare the payroll tax with proposed alternative sources of financing spelled out in House or Senate bills on Medicare. Another possibility that could be explored if additional studies find that even noncovered sectors in the society do bear a part of the burden of paying the benefits is the use of excess reserves of Medicare HIF to fund medical services for the noncovered poor. Finally, simulations on the effects of the tax structure on the cross-subsidies and financial viability of the Program will be performed in the next component study on Medicare.

## VI. SUMMARY AND CONCLUSIONS

Some of the most important conclusions from the study are:

1. Cross-subsidies by income demonstrate the importance of having a contribution and benefit structure that will ensure the occurrence of the desired cross subsidies.
2. Aside from income, utilization rates and the average value of claims, morbidity rates and claims made in behalf of dependents are also important determinants of cross subsidization.
3. Due to the low utilization rates, the National Capital Region is the primary source of subsidy for the rest of the country; it is, however, recommended that the reasons for the high variance of utilization across regions be investigated further.
4. Regression analysis using income, age, sex and regional location as explanatory variables for cross-subsidies generally supports the findings from the cross-tabulations.
5. The Medicare tax is regressive, assuming that the worker bears the full burden of the tax, or, in a general equilibrium context, there is reason to believe that other sectors not covered by Medicare are adversely affected by the tax. The CGE model indicates that all unskilled workers, even those in the agricultural and informal sectors, suffered a decrease in wages although there is no evidence that consumers in general were unfavorably influenced.
6. Administrative ease, stability and acceptance are some of the advantages of the payroll tax in financing Medicare benefits which may outweigh considerations on deadweight loss.

The heroic conclusions above were made in spite of the fact that the data we obtained posed some problems. Future studies which could improve and update the database and the methods (i.e., the measure of cross-subsidization and the CGE) would be most welcome in order to better serve the purposes of policy-making.

## Appendix A. LIST OF GIS REGIONAL OFFICES

Region I	Laoag, Dagupan Abra Benguet Ilocos Norte Ilocos Sur Nueva Vizcaya (portion) Pangasinan La Union (portion) Mountain Province
Region II	Tuguegarao, Cagayan, Baguio Baguio La Union (portion) Benguet (portion) Mountain Province (portion) Cagayan Apayao Isabela Quirino Nueva Vizcaya (portion) Batanes (portion) Ifugao
Region III	Cabanatuan, Tarlac, San Fernando, Bataan Nueva Ecija Tarlac Pampanga Bataan Zambales
Region IV	Lucena, Batangas Quezon Batangas Marinduque Oriental Mindoro Occidental Mindoro
Region V	Naga, Sorsogon Albay Camarines Norte Camarines Sur Catanduanes Sorsogon Masbate



Region VI	Palawan, Iloilo Palawan Aklan Capiz	Iloilo Antique (portion)
Region VII	Dumaguete, Cebu, Bacolod Negros Oriental Siquijor Bohol Surigao del Sur	Negros Occidental Cebu South Leyte (portion) Antique (portion)
Region VIII	Leyte, Samar Samar Island Leyte (portion)	
Region IX	Dipolog, Zamboanga Zamboanga del Norte Zamboanga de Sur Misamis Occidental Sulu Tawi-Tawi Basilan	
Region X	Butuan, Cagayan de Oro Agusan del Norte (portion) Surigao del Norte Lanao (north and south) Bukidnon Camiguin Misamis Oriental	
Region XI	Davao Davao Sultan Kudarat (portion) Agusan del Sur (portion) South Cotabato	
Region XII	Cotabato Maguindanao North Cotabato Sultan Kudarat (portion)	
NCR	Manila, Quezon City Laguna Cavite Quezon City Batanes Caloocan	Bulacan Manila Rizal Romblon Pasay

## Appendix B. CROSS-TABULATIONS FROM THE G SIS SAMPLE

Table B1  
INCOME, CLAIMS, CONTRIBUTIONS AND EXPENDITURE EXPERIENCE  
BY INCOME GROUPS, G SIS, 1992

	Income Groups				Total
	<2000	<4000	<6000	>=6000	
No. of Members	1,421	441	85	53	2,000
% of Total Members	71.05	22.05	4.25	2.65	100.00
Total Income	14,986,641	14,750,140	4,917,960	5,671,488	40,326,229
% of Total Income	37.16	36.58	12.20	14.06	100.00
Aver. Monthly Income	878.88	2,787.25	4,821.53	8,917.43	1,680.26
Total Contributions	377,887	264,600	51,000	31,800	725,287
% of Total Contrib'n	52.10	36.48	7.03	4.38	100.00
as a % of Income	2.52	1.79	1.04	0.56	1.80
Total Medicare Expen's.	448,713	130,795	34,701	22,781	636,991
% of Total Expen's.	70.44	20.53	5.45	3.58	100.00
Number of Claims	301	68	14	9	392
% of Total Claims	76.79	17.35	3.57	2.30	100.00
Aver. Value of Claims	1,491	1,923	2,479	2,531	1,625
Utilization Rate	21.18	15.42	16.47	16.98	19.60
Cross-Subsidization (%Contrib/%Expenditures)	0.740	1.777	1.291	1.226	1.000

INCOME, CLAIMS, CONTRIBUTIONS AND EXPENDITURE EXPERIENCE BY AGE GROUPS  
G SIS, 1992

	Age Groups			Total
	<26	26-45	>=45	
No. of Members	19	1,142	839	2,000
% of Total Members	0.95	57.10	41.95	100.00
Total Income	484,802	23,008,890	16,832,537	40,326,229
% of Total Income	1.20	57.06	41.74	100.00
Aver. Monthly Income	2,126	1,679	1,672	1,680
Total Contributions	7,793	420,558	296,936	725,287
% of Total Contrib'n	1.07	57.99	40.94	100.00
as a % of Income	1.61	1.83	1.76	1.80
Total Medicare Expen's.	3,036	414,420	219,534	636,991
% of Total Expen's.	0.48	65.06	34.46	100.00
Number of Claims	2	241	149	392
% of Total Claims	0.51	61.48	38.01	100.00
Aver. Value of Claims	1,518	1,720	1,473	1,625
Utilization Rate	10.53	21.10	17.76	19.60
Cross-Subsidization (%Contrib/%Expenditures)	2.254	0.891	1.188	1.000

Table B3  
 INCOME, CLAIMS, CONTRIBUTIONS AND EXPENDITURE EXPERIENCE  
 BY GENDER, GSIS, 1992

	G e n d e r		T o t a l
	Male	Female	
No. of Members	1,058	941	1,999
% of Total Members	52.93	47.07	100.00
Total Income	20,122,176	20,194,765	40,316,941
% of Total Income	49.91	50.09	100.00
Aver. Monthly Income	1,585	1,788	1,681
Total Contributions	358,952	366,095	725,047
% of Total Contrib'n	49.51	50.49	100.00
as a % of Income	1.78	1.81	1.80
Total Medicare Expen's.	347,933	289,058	636,991
% of Total Expen's.	54.62	45.38	100.00
Number of Claims	222	170	392
% of Total Claims	56.63	43.37	100.00
Aver. Value of Claims	1,567	1,700	1,625
Utilization Rate	20.98	18.07	19.61
Cross-Subsidization (%Contrib/%Expenditures)	0.906	1.113	1.000

## Appendix C. TECHNICAL DESCRIPTION OF THE CGE MODEL<sup>12</sup>

### Basic Model

Consider a small open economy with  $N$  local production sectors,  $N$  Armington or composite good sectors,  $K$  variable factors, an aggregate consumer, and the government. The local production sectors produce both an import substitute and an exportable good. Import substitutes and exportable commodities are assumed to be qualitatively different. A transformation function between the import substitute and the exportable defines how the various producers in a given sector allocate resources for export and local use.

A composite-good sector aggregates the import and its corresponding local substitute into a composite good which in turn is demanded by producers as an intermediate input and by consumers and investors for final consumption. An Armington elasticity of substitution between the local and imported goods defines how users of the commodity shift from one to the other as prices change.

### Production Sectors

Each sector consists of competitive producers with identical technology. The production technology is a nested Leontief-function of an aggregate intermediate input and value added. The aggregate intermediate input is a Leontief function of the  $N$  composite goods. The value added is a Constant Elasticity of Substitution (CES) function of a variable and a sector-specific factor.

The transformation function is described by the following:

$$T_j = T_j(Q_j^s, E_j^s, -V_j, -A_j) = 0. \quad (1)$$

where  $Q_j^s$  and  $E_j^s$  are the respective amounts of the import substitute and the exportable that are produced in sector  $j$ . The function  $T_j$  is a constant elasticity of transformation (CET). The elasticities of transformation in the model define the curvature of the production possibility surfaces.

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<sup>12</sup>This basic model is taken from "General Equilibrium Effects of a Currency Devaluation" by Dr. Ramon Clarete (1991) with a few modifications made by Dr. Clarete himself to incorporate the Medicare tax into the model.

The value added function in sector  $j$ ,  $V_j$ , is a function of two variable factors, capital ( $K_j$ ) and labor ( $L_j$ ), as well as a sector-specific factor,  $F_j$ :<sup>13</sup>

$$V_j = \left[ \alpha_j K_j^{\rho_j} + \beta_j L_j^{\rho_j} + (1 - \alpha_j - \beta_j) F_j^{\rho_j} \right]^{\frac{1}{\rho_j}} \quad (2)$$

If we let  $\sigma_j$  be the elasticity of factor substitution, then this is equal to  $1/(1-\rho_j)$ . The variable capital in each sector is the depreciation cost. Labor is assumed to be homogeneous and perfectly mobile between sectors. The sector-specific factor is a composite of fixed factors including fixed structures, machineries, and land. These factors cannot be profitably moved to other sectors within the time period required for the economy to reach an equilibrium following a shock.

The intermediate inputs are used in fixed proportion to the amount of output that is produced. If we choose the unit of output of the composite goods, the import substitute and the exportable, such that their respective producer prices are one, then we can define the input-output coefficients  $a_{ij}$  as follows:

$$(Q_j^s + E_j^s) a_{ij} = R_{ij} \quad (3)$$

where  $R_{ij}$  is the amount of intermediate input  $i$  required to produce the joint output of the import substitute and the exportable in sector  $j$ . Formally,

$$A_j = \min \left[ \frac{R_{ij}}{a_{ij}}, i = 1, 2, \dots, N \right] \quad (4)$$

The profit function in each sector is defined as:

$$\pi_j = p_{sj} Q_j^s + p_{Ej} E_j^s - r K_j - (w + \tau_M) L_j - \sum_{i=1}^N p_{ci} R_{ij} \quad (5)$$

where  $p_{sj}$  and  $p_{Ej}$  are the producer prices of the import substitute and the exportable;  $p_{ci}$ ,  $w$  and  $r$  are the prices paid by producers for the composite good  $i$ , labor and variable capital, respectively. The profit in sector  $j$  is the imputed earnings of the fixed factor in the sector. The first derivative of the profit function with respect to  $p_{sj}$ ,  $p_{Ej}$ ,  $w$ ,  $r$  and  $p_{ci}$  give the output supply functions of the import substitute and the exportable produced; the factor demands for labor and variable capital; as well as the intermediate demand for the composite good of producers in sector  $j$ , respectively.

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<sup>13</sup>The notation convention used is that supplies or outputs are superscripted with the letter and demands do not have any superscripts at all. For example,  $K^s$  refers to the supply of capital ( $K$ ) in the economy while  $K_j$  denotes demand for capital in sector  $j$ .

Adding up the demand for an input of all sectors in the economy gives the total demand for the inputs in the economy. Formally,

$$\begin{aligned} L^D &= \sum_{j=1}^N \frac{\partial \pi_j}{\partial w} \\ K^D &= \sum_{j=1}^N \frac{\partial \pi_j}{\partial r} \\ C_i^{ID} &= \sum_{j=1}^N R_{ij} \quad i = 1, 2, \dots, N \end{aligned} \quad (6)$$

where  $L^D$ ,  $K^D$  and  $C_i^{ID}$  are respectively the total demands for composite labor, variable capital and a composite good  $i$  used as intermediate inputs.

### Composite Good

Users of outputs in the economy have a choice of using an imported good or its corresponding locally produced substitute. Let  $C_j^s$  be the amount available of the composite good associated with an import which competes directly with the import substitute produced in sector  $j$ . Then:

$$C_j^s = \left[ \gamma_j Q_j^{\mu_j} + (1 - \gamma_j) I_j^{\mu_j} \right]^{\frac{1}{\mu_j}} \quad (7)$$

$Q_j$  and  $I_j$  are respectively the use of the import substitute  $j$  and the imported good  $j$  in producing the composite good  $C_j^s$ . The parameters  $\mu_j$ 's reflect the scope of substitution between the imported and the locally produced good while the parameters  $\gamma_j$ 's are the respective shares of the locally produced good in the total cost of the composite good. The input combination of the import and its substitute depends upon the following cost minimization condition:

$$\frac{\partial C_j^s / \partial Q_j}{\partial C_j^s / \partial I_j} = \frac{q_{Ij}}{q_{Oj}} \quad (8)$$

where  $q_{Ij}$  and  $q_{Oj}$  are respectively the user prices of the import and its substitute. From equation 8, one can derive the demands for the imported good or service and its local substitute.

The supply of imported good  $j$  to this small-open economy,  $I_j^s$ , is perfectly price elastic. Let  $\bar{v}_{Ij}$  be the world price of the imported good  $j$  denominated in foreign currency and  $FX_j$  the foreign exchange which is required in order to buy an imported good  $j$ . The

amount of foreign exchange required per unit of the imported good  $j$  is computed as:

$$\frac{FX_j}{I_j^s} = \bar{v}_{1j} \quad (9)$$

Since in a small open economy world prices are given, this per unit requirement of foreign exchange to import is fixed.

### Private Consumer

Private consumers are represented in the model by an aggregate private consumer who is endowed with the resources used in local production. These endowments constitute the respective total supplies of labor, variable capital and sector-specific factors.

$$\begin{aligned} L^s &= \bar{L}_k \\ K^s &= \bar{K} \\ F_j^s &= \bar{F}_j \end{aligned} \quad k = \text{unskilled, skilled} \quad (10)$$

The income of the consumer ( $Y_p$ ) is given by the following:

$$Y_p = \sum_k (w_k - \tau_M) \bar{L}_k + r \bar{K} + \sum_{i=1}^N \pi_i + NLST_p \quad (11)$$

where  $NLST_p$  stands for the net lump sum transfers received by the private consumer. This amount covers direct and other taxes and fees collected by the government net of subsidies received from the latter. Only indirect tax measures such as customs duties, excises and value added taxes plus the Medicare tax are explicitly incorporated in this model. It is thus assumed that these excluded income flows are transferred between the government and private consumer without adding further distortions in the economy.

The consumer maximizes a Cobb-Douglas utility function subject to his income constraint:

$$\begin{aligned} \text{Max } U &= \prod_{i=1}^N D_{Pi}^{\delta_i} \\ \text{s.t. } \sum_{i=1}^N q_{Di} D_{Pi} - Y_p &= 0 \end{aligned} \quad (12)$$

where  $D_{Pi}$  and  $q_{Di}$  are respectively the amount that is demanded by the private consumer and the price paid by consumers for the consumer good and  $\delta_i$  is the proportion of income spent on the consumer good  $i$ .

The production of consumer goods is given as follows:

$$D = \min \left[ \frac{C_{i1}}{d_{i1}}, \dots, \frac{C_{in}}{d_{in}} \right] \quad (13)$$

where  $d_{ij}$  is the per unit demand of composite good  $j$  used in providing consumer good  $i$ .

### Government Sector

The government is featured here as another consumer in the model. Its income ( $Y_G$ ) is derived from capital inflows (FK) denominated in foreign currency, net lump sum transfers received ( $NLST_G$ ), and the revenues from customs duties ( $T_I$ ) and excises ( $T_E$ ):

$$Y_G = T_I + T_E + VAT + MED + NLST_G + eFK \quad (14)$$

where  $e$  stands for the exchange rate. The tax revenue components of the government's income are computed as follows:

$$\begin{aligned} T_I &= e \sum_{j=1}^N \tau_{Ij} P_j^W I_j \\ VAT &= \sum_{j=1}^N P_j Q_j^S - \sum_{i=1}^N \tau_{vi} P_{ci} R_{ij} \\ T_E &= \sum_{i=1}^N \tau_{Ei} P_{ci} C_i^S \end{aligned} \quad (15)$$

where  $\tau_I$ ,  $\tau_v$  and  $\tau_E$  are respectively the  $N$ -dimensional vectors of effective tax rates on imported products and domestic sales of the composite good and value added. If a sector is not subject to a given tax, then the sector's tax rate in the corresponding tax vector is equal to zero. The Medicare contributions of employers and workers are computed as follows:

$$MED = \tau_M \left[ \sum_{j=1}^N L_j + \bar{L} \right] \quad (16)$$

As the private consumer, the government is assumed to have a Cobb-Douglas utility function with composite producer goods as the arguments which it maximizes subject to its income constraint.



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### Foreign Trade and External Payments

Since the country is a price taker in export markets the demands of the rest of the world for the country's exportable goods are perfectly price elastic. The amount of foreign exchange that is generated from selling the amount of exportable good produced in sector  $j$  is computed as:

$$FX_j^S = \overline{v_{Ej}} E_j^S \quad (17)$$

where  $v_{Ej}$  is the exogenous world price of exportable  $j$ . If the world price of good  $j$  falls, then the per unit requirement of exported good  $j$  to earn one unit of foreign exchange will be lower. Changes in these world prices are in a way equivalent in the modeling sense to changes in production techniques.

The trade deficit in the model is equal to:

$$TD = \sum_{j=1}^N [\overline{v_{Ij}} I_j^S - \overline{v_{Ej}} E_j^S] \quad (18)$$

An exogenous amount of capital inflows  $FK$  enters the country on a periodic basis. As discussed above under the subheading on the government sector's income, this amount is given to the government. However, in real life, these inflows are made up of foreign private investments, private and public sector short- and long-term borrowings from abroad, official development assistance and income transfers received by residents in the country from the rest of the world. The amount represents net interest payments on foreign debt, any profits repatriated abroad by multinational corporations, debt amortization, any lending to the rest of the world by residents, and other outgoing income transfers.

The balance-of-payments account is equal to:

$$BP = TD - FK \quad (19)$$

### General Equilibrium Conditions

The general equilibrium conditions in this basic model consist of the following:

- (a) zero-profit conditions in all production activities in the economy;
- (b) market-clearing conditions for all factors, goods and services produced; and
- (c) balance-of-payments condition.

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