

Major Applied Research Paper No. 5

**PUBLIC AND PRIVATE INTERACTIONS
IN THE HEALTH SECTOR
IN DEVELOPING COUNTRIES**

**Phase I
Review of Concepts and Literature,
and Preliminary Field Work Design**

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ABSTRACT

This paper is the first phase of a three-phase HFS major applied research activity that examines public and private interactions in health sectors of developing countries. A review of literature and experiences is conducted on payment systems, organizational frameworks, multiple job-holding, and competition between sectors. The report outlines the proposed field and analysis work (Phases II and III) for the topic.

To remedy government budget constraints in health care, an option for developing countries is to encourage the private sector to assume a greater role in financing and providing health services, increasing interactions between the public and private sectors. When considering this alternative, concepts such as sharing public resources with private providers and determining the division of service financing and provision by sector must be taken into account. Because many physicians in developing countries allocate their time between jobs held in both sectors, multiple job-holding is examined using behavioral equations for health personnel time allocations. This approach models how the two sectors are affected by the choices made.

The review of literature on public-private interactions shows that such interactions are not well documented, although private sectors in general have the finances for large investments.

Field data collection on public-private interactions is recommended in four countries: Egypt, Kenya, India, and Pakistan.

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EXECUTIVE SUMMARY

This paper constitutes the first phase of a three-phase Health Financing and Sustainability (HFS) major applied research project in the area of "Public and Private Interactions in the Health Sector in Developing Countries" and lays the foundation for field work and analysis to be carried out in Phases Two and Three of the project.

Faced with budgetary constraints, most developing countries are finding it increasingly difficult to commit the resources required to finance and deliver quality health care. Of the many options for spreading the cost of care, one is to promote a greater role for the private sector in financing and providing health care. With a large public sector already in existence in most developing countries, one outcome of greater involvement of the private sector would be increasing interactions between the two sectors. This paper is devoted to a study of these public-private interactions.

The paper presents a conceptual and analytical framework for understanding public-private interactions in developing countries. The conceptual section builds upon three main arguments. First, it is maintained that public financing of health services should be separated from arguments about public provision. Second, it is contended that one of the most important forms of public-private interactions is the explicit or implicit decision about which services are to be financed or provided by which sector. Third, it is argued that sharing of public resources with the private providers of health care may be an attractive strategy.

An analytical model is presented which examines multiple job-holding by health personnel in developing countries. The model derives estimable behavioral equations of the physicians' time allocation between the two sectors, and is used to demonstrate five propositions concerning the physicians' behavioral response to changes in policy instruments that influence it.

A review of the literature on public-private interactions is conducted using documented sources as well as the country experiences and knowledge of other researchers. The review finds that country experiences with both public and private sectors operating together in health care are not well documented, although the issues of complementing and conflicting behavior are widely recognized by most governments. The review finds that the private sector in most developing countries is financially capable of medium-to-large investments, provided that the economic environment is conducive to do so.

The final chapter contains a preliminary discussion of future research to be carried out in Phases Two and Three of this project. Four countries: Egypt, Kenya, India, and Pakistan are identified as potential host countries, and arguments are presented for possibly choosing India from amongst these.

1.0 INTRODUCTION

In most developing countries, governments are the major providers of health services, which are typically provided at little or no charge to the consumer. Even though many countries have achieved remarkable reductions in morbidity and mortality in recent years, further gains are becoming increasingly difficult, restricted as they are by the limited capacity of health systems to deliver basic types of services and information to households that are often dispersed and poor. Moreover, technological advances have made most health care inputs, especially drugs and equipments, more costly. Simultaneously, rising incomes, aging populations, and urbanization have raised consumer demands for health care services. These competing needs have put tremendous pressure on health systems at a time when public spending in general cannot be increased; indeed, in many countries it will be challenging enough just to maintain the existing spending levels.

At the same time, macroeconomic difficulties have burdened governments with high debts and recession, leading to a situation where public resources for health have either levelled off or declined in most developing countries. These financial constraints have led to a rethinking of major economic and management issues at the policy, program, and implementation levels. Issues like quality of medical services, resource use in facilities, cost containment, health care efficiency, alternative means of service provision, and finance of health care, among others, are rapidly gaining priority and many options for spreading the cost of care are being considered. These include user fees in public facilities, alternative financial mechanisms like health insurance, or shifting additional burdens to the private sector for those who can afford to pay. Shifting additional burdens to the private sector may be desirable only if a strong private health care market existed, and would be a superior alternative only if there were reasons to believe that the private sector is generally more efficient than the public sector. In any case, greater involvement of the private sector would lead to increasing interactions between the public and private sectors in the form of sharing of often-scarce human resources and infrastructure. Government low budgets can lead to underpaid providers eager to work in the private sector and inadequate public health services, resulting in private demand for health services even in the presence of a free public system. This creates both supply and demand-side incentives for public doctors to work in the private sector, and for private doctors to use excess capacity in the public sector. This report explores these “public-private interactions.”

The HFS Project which provides, inter alia, technical assistance and applied research to developing countries in the area of health sector policy development and health services management, has taken up major applied research activities in five technical areas: cost recovery, costing, social financing, resource allocation, and public-private collaboration. This study of public-private interactions in the health sector in developing countries is a part of the major applied research activity of HFS in the technical area of public-private collaboration.

1.1 PUBLIC AND PRIVATE HEALTH SECTORS

In most countries, the private health sector has existed much before public health systems were ever organized. In developing countries, however, concerns of ensuring that all income groups have equal access to health care, guaranteeing a minimum level of health status for the entire population, and making modern health care accessible have led to public domination of health care delivery. Although these commitments have not changed, the resources required to finance and provide health care services are increasingly becoming a financial burden for most governments.

For this reason, the appropriate role of government in the health sector has become a subject of some debate, and there is a growing recognition of the scale and importance of private sector activities in the provision and finance of health care. The policy of choice in developing countries can be public provision, public financing, public regulation of the private sector, or some combination of these approaches. Public institutions may choose to directly administer most health services, or allow and encourage the private and quasi-public entities to be the primary providers. In addition, or as an option, government policy could be to help finance health care directly or indirectly through explicit or implicit subsidies, which can be given either to private and quasi-public providers or to individuals through transfers. Alternatively, the principal function of public agencies could be to regulate, monitor, and maintain quality control.

There are, undoubtedly, many economic justifications for government involvement in both financing and production of health services. These include the presence of income inequalities, consumption externalities, and the public and merit goods argument. Moreover, there are certain critical functions that the public sector appears to be uniquely qualified to perform. The government plays an important role in training to ensure, for example, that health professionals are trained in public health and preventive care. In addition, governments in developing countries need to protect their populations by supporting research and development and financing public goods such as vector control and vaccination programs.

Government production of health services is often criticized on the grounds that government firms are inefficient producers compared with private sector firms. However, Cross and Levine (1990) argue, regardless of the competitiveness or efficiency of the private sector, there is unquestionably a role for the government in ensuring adequate health services. Responsibility for financing or providing merit goods like sanitation, communicable disease control, etc. and health care for the indigent falls to the public sector. Akin, et al., (1987) suggest that in a few countries it may even be practical to make use of the non-government sector for preventive care of the type that benefits others than the recipient. The public health authorities might contract with private providers for certain public goods, like vector control and immunization.

The interaction between the public and private sectors extends beyond the overlapping areas of operation; it encompasses all the various permutations and combinations involving the two sectors in the delivery of health care, including the production, finance, and regulation of health services. Given the insufficient availability of human and infrastructure resources in most developing countries, this interaction is as likely to lead to conflicts as to complement each sector's

activities. The main concern for public policy, therefore, is to strive towards a Pareto-improving situation, in the sense of encouraging private sector involvement without adversely affecting the existing public sector health delivery system. The challenge then is to identify the manner and nature of services in which to encourage the non-government sector, and at the same time to regulate the health market, especially the private for-profit sector.

This paper is a report of Phase 1 of the HFS major applied research on public-private interactions, and is organized as follows. Chapter 2 initiates the discussion by defining the basic concepts of public and private health sector, public-private interactions, and payment systems. Chapter 3 contains a review of developing country literature and experiences and discussion of the basic issues. A conceptual model of public-private interactions is the basis of Chapter 4. Finally, Chapter 5 presents a preliminary discussion of goals, objectives, methods, and field research design for subsequent phases.

We hope that this paper will be of interest to organizations and governments effecting policy changes; to health economists, policy analysts and implementing agencies seeking examples of applications of analytical approaches and policy evaluation methodology; and to graduate students in health economics and researchers in health care in developing countries. While some parts of the paper are highly technical (for example Chapter 4), others follow a much more general approach in the sense that they draw inspiration from established views (and from other researchers as well as our own experiences) of public and private interactions in the health sector in developing countries.

2.0 DEFINITIONS

Before addressing the key issues of public-private interactions in developing countries, it is necessary to clarify the underlying concepts around which the discussion revolves. This chapter starts with the definition of public and private provision and financing of health care. The next section examines the economic arguments for expanding the role of the private sector in health care in developing countries. The chapter concludes with a discussion of meaning and implications of public-private interactions in the health sector in developing countries.

2.1 PUBLIC AND PRIVATE PROVISION AND FINANCING OF HEALTH CARE

The public health sector is composed of the government agencies responsible for all health care delivery and allied activities, and includes the administration, regulation, financing, and direct provision of health care by central, provincial, or local governments. It encompasses the government agencies responsible for allocation, expenditure, and monitoring of funds for health services; establishment of norms and regulations for public and private health care institutions; collection and compilation of health-related statistics; the schools of medicine set up for imparting education and training to physicians, nursing and allied health personnel; financing of health care through insurance and market borrowings; and direct provision of health services in rural and urban areas.

The private health sector, on the other hand, encompasses all non-government personnel and institutions that are involved directly or indirectly in the production, financing, delivery, and distribution of health services and ancillary goods and services. The private sector generally consists of the for-profit sector as well as the non-profit-making charitable organizations, and includes physicians in private practice, clinics, hospitals, pharmacies, and traditional healers. It may also include health maintenance organizations, insurers, or third-party payers, and firms providing support services. In most countries, the for-profit private sector comprises the large majority of private health services, with non-profit and missionary organizations and charitable trusts accounting for the remainder.

Although the preceding discussion emphasizes the distinction between the public and private sectors, an important observation for this paper is that in many (if not most) developing countries, the distinction between the public and private health sector is blurred, since the same set of individuals are involved in both. A key feature of health care delivery by the government in many developing countries, for example, is that a large number of government health personnel also practice in the private sector. In some cases, public health facilities (beds, equipment, supplies) as well as other resources are shared between public and private sectors.

2.2 WHY PROMOTE THE PRIVATE HEALTH SECTOR?

The HFS Project offers one definition of public-private collaboration as the “public sector will allow, regulate, and often, foster development of the private sector to improve allocation, use and management of resources” (HFS Technical Theme Paper, Year One, 1990). Indeed, one means of improving the sustainability of financing and provision of health is to promote or permit a greater role for the private sector as a provider and source of financing. Following Cross and Levine (1990) and Lewis (1988), there are several arguments in favor of expanding the role of the private sector.

- ▲ Governments in most developing countries are committed to providing free health services to either all or some designated sections of the population. While this resolve has by no means weakened, the program of bringing basic health care to the targeted population has been inhibited by insufficient resources required to provide health services. Part of the reason for this is the financial crisis in most of the developing countries which has adversely affected the health budget because of high recurrent costs. Additional resources need to be tapped, and increased private sector activity is one of the options for spreading the costs of health care.
- ▲ Much of the economic rationale for government involvement in the health sector revolves around incomplete and imperfect health markets. Since health expenditures are often unpredictable and large, financing them requires credit facilities, deferred payment schemes, and/or insurance arrangements, which the private sector is usually not in a position to extend. While this may be a compelling finance of health care in most developing countries, it makes good economic sense to leave production of health care to the private sector.
- ▲ Government production of health care in developing countries also finds support in the public and merit goods argument. Public provision of health care is warranted in cases where the society suffers from negative externalities from the presence of disease vectors or of some individuals suffering from preventable communicable diseases. In these cases, government interventions are public goods. However, most curative care (and some preventive services like pre-natal care) are not public goods, and their finance and production can be left to the private sector.
- ▲ Government intervention is warranted in situations of insufficient consumption of health care which has merit for the population. This is the merit goods argument for extending curative health services to the poor in developing countries. However, continued government intervention is not required once the value of these services is understood and internalized by the target population. Most curative services, therefore, need not be subsidized by the government, and can be provided by the private sector.

- ▲ Use of nongovernment resources is further motivated by ample evidence of inefficiency by the government health care providers. Following Akin et al (1987), these inefficiencies can be listed as demand-side (inappropriate use of services, rationing by queue, etc.) or as supply-side (over-centralization, under-funded current accounts, poor quality, logistical problems, etc.). This has raised the question of the desirability of direct government involvement in all aspects in production of health care services: private provision of services (other than preventive health care) is often proposed as a more efficient alternative.
- ▲ Perhaps because private health care is deemed more efficient, and private health care delivery is supposed to be of a better quality, the demand for private care can be expected to increase with real income. Economic development would therefore bring about an expanded role for the private sector.
- ▲ There appears to be a strong correlation between urbanization and demand for private health care. Cross and Levine (1990) explain this in terms of the effects of proximity to services, cultural influences, etc. Considering the rapid urbanization in developing countries, there appears to be every reason to expect a higher demand for private health care.
- ▲ Expanding private health services in a rational manner is potentially a highly leveraged activity from the point of view of governments and donors. This means that relatively small start-up efforts can result in large-scale, long-term increases in the availability of health services. And since private firms provide much of the capital for an enterprise, the long-term costs to the public sector are low.

2.3 PUBLIC-PRIVATE INTERACTIONS

Greater involvement of the private sector can be expected to lead to increasing interactions between the public and private sectors for a variety of reasons. First, both sectors would be competing for similar types of resources, which are typically in short supply in developing countries. These include both factors of production, labor (trained health personnel), and capital (funds required for financing large outlays for technology and equipment). The expected outcome would perhaps be that both the sectors end up sharing the available resources. While this may have its merits, there is a huge risk that these resources are put to a better use in one sector to the detriment of the other. To the extent that controls are weaker in the public sector, government facilities and its users are more likely to suffer than the private ones.

Second, both sectors would be competing in the same market for almost the same set of consumers, at least in the second and third quartile income ranges, and this competition could foster greater efficiency and better quality of care.

Third, increasing interactions may lead to an equilibrium situation where each sector concentrates on areas in which it has a natural advantage, establishing a hierarchy of services that each will offer.

Fourth, given their vastly differing functioning styles, the two sectors would mutually benefit from learning from each other's experiences in their respective areas of weakness. For example, the public sector may benefit from mimicking the private sector along a number of dimensions. This improvement could be in cost containment directly through better management of resources, or indirectly through reduction of wasteful expenditure in quality-control or in general administration. In any case, there are reasons to believe that positive changes can be effected by incorporating private sector-like thinking.

One of the arguments often put forward as an explanation for poor public sector performance is the lack of autonomy in decision making. This organizational feature, typical of most public sector enterprises, becomes a major operational disincentive to efficient functioning. For example, the administration of the public hospital is only superficially involved with the process of planning, the preparation of budgets, and concern for profit. A private-sector management, on the other hand, has a much deeper involvement with every facet of planning and implementation, at least of the immediate unit. Allocation and utilization of resources can perhaps be improved by allowing for decentralization, at least in the budget-making process and related financial activities.

Another area where there are major differences between the functioning of the two sectors is personnel management. Public sector facilities are typically characterized by an indifferent and disinterested staff. While there are many reasons for this difference in attitudes, a significant one is the almost total absence of incentives to motivate public-sector employees. The bureaucratic stranglehold has become so complete that even minor deviations from standardized reward scales are not acceptable. While, therefore, there is little incentive to put forth effort, there is even less incentive to put forth the minimum required effort. The result is a pervasive apathy, which, in a brief period, questions the very existence of the public sector. Introduction of a system of private sector-type incentives is one solution that merits consideration.

Poor quality of care associated with public hospitals can partially be explained by the near absence of user fees, although Fred Golladay, senior economist at The World Bank, points out that it is debatable whether introduction of fees would necessarily improve efficiency. While there is evidence of substantial ability to pay in most developing countries (Akin, et al., 1987; de Ferranti, 1985), the issue has sufficient emotive content to attract a partisan thinking in populist political circles: governments would continue to feel obliged to set up free health facilities, even when these funds could be employed more gainfully elsewhere in the health sector. A starting point could be setting up private sector-type wards in public hospitals for those who can afford to and are willing to pay. At the same time, creation of public sector-type wards in each private facility can also be considered. The facility would provide health care in these wards at the prevalent public facility rates, in return for which the private sector would be eligible for government subsidies, soft loans, outright grants, or any other suitably compensating incentive.

Third, both sectors would be competing in the same market for almost the same set of consumers, at least in the second and third quartile income ranges, and this competition could foster greater efficiency and better quality of care.

Fourth, increasing interactions may lead to an equilibrium situation where each sector concentrates on areas in which they have a natural advantage, establishing an hierarchy of services that each will offer.

This discussion can be summarized in the form of four distinct research questions:

- ▲ What is the optimal level and methodology of resource-sharing by the two sectors?
- ▲ What lessons can be learned from the different management, organization, and operation of public and private sectors?
- ▲ What measures can be taken to improve overall efficiency of both the sectors, thereby improving the general production and availability of health services?
- ▲ What are the areas in which the public and private sectors have a comparative advantage in both financing and production of services?

On the basis of these questions, public-private interactions in the health sector can be defined as the mechanics by which the public and private sectors connect, combine, co-act, cooperate, and conflict in the production, finance, and regulation of the health services. This includes the manner in which the public and private sectors produce or finance complementary or similar but differentiated services. This also includes the logistics of interplay and inter-responsiveness of the two sectors in providing and financing the complete spectrum of health services. This co-action and cooperation may be in the nature of sharing tangible resources, like infrastructure and labor, or incorporating concepts and lessons from each other's experiences, like management techniques, information systems, and accounting rules. It may also involve the designation or acceptance of responsibilities for specific health services between the public and private sectors.

2.4 PAYMENT SYSTEMS

There are many possible ways of paying physicians for medical care: fee-for-service, salary, capitation, and case payment. None are linked inextricably to any ways of organizing a country's medical services. National health insurance systems and national health services can be found using each of the payment methods, although national health services tend to use the more predictable device of salary and to avoid fee-for-service. A brief definition of these payment systems follows.

- ▲ Fee-for-service is payment for each medical procedure performed by the physician. The payment for each procedure is usually based on a pre-determined fee schedule, which is common knowledge to both the physician and the patient.

- ▲ Capitation is a fixed annual payment for each person on a list regularly assigned to a doctor. The physician gives all the necessary care to the members on the list who come to him. Even if a person never visits him, the physician automatically collects his capitation fee; even if a person has many medical problems, the physician can usually collect no more than the capitation fee. Since the capitation fee covers only one doctor-patient pair, referrals to other physicians and facilities must be financed separately. Capitation systems are not widely prevalent. Some countries which follow this system are Great Britain, Italy, and Spain.
- ▲ Salary is a fixed amount of money scaled according to the rank of the job and usually paid according to the amount of time the doctor works. Patients usually pay the doctor nothing. The payment system ties the doctor to the organization; payment does not depend on the variable personal relationship between the doctor and the patient, as do capitation and fee-for-service payments. The type of doctor-patient relationship varies according to the conditions specified by the organization.
- ▲ Case payments are fixed sums given to the doctor in exchange for the promise of giving a patient bundles of necessary care. They differ from capitation fees, which are paid for persons on a list regardless of illness. Case payments differ from fee-for-service in that payments are set prospectively and do not depend upon the number or type of procedures performed.

The fixing of physicians' salaries often becomes involved in governments' larger economic plans, since salaried medical work usually is a part of organized systems involving other facets of the economy. In contrast, capitation and fee-for-service rates are set more autonomously; if dependent on any organized system, these are part of a separate medical sector, such as the national health insurance.

Salaried methods of payment are preferred by many less-developed countries because they are easy to administer, although, according to Joseph P. Newhouse, Director of the Division of Health Policy Research and Education, Harvard University, this ease would depend on the degree to which the system is merit-based. Personnel costs can be predicted during the next financial year; they increase only if the government decides to give pay raises, and they do not fluctuate according to the efforts of the doctor or the demands of the patients. Moreover, paperwork is minimized, since the patient is not billed for any procedure performed.

3.0 REVIEW OF LITERATURE AND EXPERIENCE OF DEVELOPED AND DEVELOPING COUNTRIES

3.1 INTRODUCTION

For the past decade or so, the public sector of the economy has been subject to increasing scrutiny and challenge. First, it is argued that the government has taken on the production of goods and services readily available from private sources. Second, as regulatory and public production activities have expanded, the costs of regulation and inadequacies of public production have become more obvious. In the spirit of these two challenges, questions are being raised about whether public financing might be combined with private production to provide merit goods more efficiently.

The last 10 years have seen a marked increase in the analysis and implementation of private-sector alternatives to the production of public-sector services. The impetus for encouraging the private sector, as already discussed in some detail earlier, has two sources: (1) opposition to the further growth of the public sector, and (2) the belief that the private sector would be a more efficient producer. Yet as private sector involvement moves beyond the acquisition of intermediate goods and services to more complex public outputs, like health services, it is subject to increasing challenge on both efficiency and equity grounds.

Discussions on mobilization of private sector resources involve at least two important questions. First, what is the public intervention where the private sector is to be encouraged? Second, how is greater private sector involvement to be achieved? Public intervention has at least three elements, each of which is a likely candidate for private participation: finance, production, and regulation. There has been a recent surge of scholarly interest in the use of user charges rather than free provision; the use of outside contractors rather than in-house production; and regulation by incentives rather than by command. (See, for example, Ambrose, Hennemeyer, and Chapon, 1990; Griffin, 1989; Candoy-Sekse and Palmer, 1988; Adreano and Helminiak, 1987; Chamberlin and Jackson, 1987; Heald and Steel, 1986; de Ferranti, 1985; Cleverly and Mullen, 1982.)

Chapter 3 is organized as follows. Section 3.2 initiates the discussion by analyzing reasons for increasing private involvement in the public sector, and examines two case studies which present valuable insights into the functioning of the two sectors. There are, indeed, some problems which have to be overcome in order to increase private sector involvement, and some of these issues are discussed in Section 3.3. Questions of efficiency and the private sector are raised in Section 3.4, and we turn to the problems of the health sector in Section 3.5, which discusses issues relating to altering the public-private mix in the health sector. It is often argued that one area in the field of health care that is not open exclusively for the private sector is the public hospital. This question forms the subject matter of Section 3.6. Most economists agree upon the important role that competitive markets play in inducing enterprises to operate efficiently. The constraints that prevent the introduction of competition in the health sector, however, seem to suggest that state regulation is necessary if the desired objectives of efficiency and access are to be met. This debate between regulation and creation of competitive market forces is discussed in Section 3.7. Section 3.8 is devoted to a brief review of the role of provider incentives, and covers the standard principal-agent

literature of industrial organization. We next turn to developing countries' experience in Section 3.9 and, in the absence of documented literature, compile a number of anecdotes from experiences and country knowledge of a number of researchers and public functionaries. Literature on public-private interactions in the health sector in developing countries being limited, we also focus on the role of the private sector in another area of public service, that of education. Section 3.10 accordingly reviews the concerned literature and attempts to draw parallels with the health sector. Section 3.11 summarizes a major study of the general potential of private investment in developing countries, which is illustrative of availability of private funds and entrepreneurship, which would become necessary if greater private involvement in the production or financing of health services in developing countries is under consideration. We end this chapter with a brief conclusion in Section 3.12.

3.2 PRIVATE INVOLVEMENT IN THE PUBLIC SECTOR

To some extent, the source of the interest in encouraging the private sector lies in a public sector grown too large. The push for private involvement in the public sector is often motivated by the desire to reduce the size of the public sector. Divestiture of a particular service is the extreme form of private sector involvement, and although many calls for divestiture occur, there are not many examples. In general, public financing has been a less significant target for private participation than has been public production. Reducing public financing may be the ultimate aim of many proponents of private sector, but it does not appear to have played a major role in actual decisions of mobilizing private enterprise. These have been more closely tied to efforts to improve the efficiency with which public goods and services are produced.

A less radical form than divestiture of reducing the role of the public sector involves contracting out a management or production of publicly financed goods and services. This approach, as discussed by Sappington and Stiglitz (1987), permits the public sector to take advantage of the assumed efficiency of private sector production, since the absence of competition and profit incentives in the public sector is not likely to result in cost minimization. At the same time, it allows for public-sector finance in areas traditionally not considered profitable by the private sector. For instance, in the health sector, as Akin et al., (1987) suggest, it may even be practical to involve the nongovernment sector in the provision of preventive care of the type that benefits others than the recipient. The public health authorities might contract with private providers for certain public goods, like vector control and immunizations, activities which the private sector typically does not participate in. The rationale behind the conclusion is straightforward: theoretical arguments seem to suggest that competitive bidding by the for-profit private sector firms for a specified output generally guarantees that the product will be produced at the lowest cost (see, for instance, Holmstrom and Tirole, 1987; and Tirole, 1988). Of course, competitive bidding is only one possible contracting strategy; others include short-term leases tied with target achievement, self-management by the employees working in the enterprise, management by shareholder cooperatives, and decentralizing control with private professional management.

Although market failure provides the simple argument for a large number of public interventions, the more recent literature discusses the subject of government failure on which the

argument of greater private sector involvement generally stands. In neither case does it inevitably follow that the proposed remedy improves the situation. In the event of market failure, the issue is whether the government can perform more effectively. With government failure, the question is reversed: can the private sector do it better? Failure of one provides no information about the other. In general, the comparison is between imperfect alternatives, not between an idealized private sector and a failing public sector.

Several examples of general inefficiency of the public sector are documented in economics literature, and need not be belabored here. (See, for instance, Davies, 1971; Gunderson, 1979; Millward, 1982; Pier, Vernon and Wicks, 1974; Rowley, 1977). Two studies, however, do deserve mention, one because it builds a case for more private sector participation on the grounds of a continuing pessimism with regard to the public sector, and the other because it studies government-owned firms operating in a competitive environment.

Lee and Anas (1989), in a study of infrastructural deficiencies (power, transport, roads, steel, etc.) in Nigeria, find that a non-performing public sector is the main reason for inefficiencies in infrastructure provision. It is maintained that the solution to the problem of infrastructural deficiencies in most African countries is not likely to be a technological one; instead, unless there is an improvement in institutional organization, logistical support services, and administration, progress would remain elusive and unpredictable. They build a case for active private sector participation by concluding that, for these reasons, the public sector would continue to remain non-performing for more time to come. Among the policy options they suggest for improving the infrastructural deficiencies are regulatory changes for enabling fuller utilization of existing private capacities, and private sector participation in production, distribution, and maintenance of selected infrastructural support activities.

Public ownership is often stated as one of the reasons for poor performance of the public sector. The essential argument is based on the fact that public ownership is diffused among all members of society, and there is then little economic incentive for any owner to monitor the behavior of the firm's management. In contrast, it is argued, the ownership of private firms is concentrated, and thus the owners have the appropriate incentives to scrutinize management to ensure efficiency in the production of goods or services. The two classifications of ownership, public and private, and the two classifications of market structure, competitive and noncompetitive, provide four categories in which firms may fall. Caves and Christensen (1980) study the category of government-owned enterprises operating in a competitive environment, and compare the post-war productivity of Canadian National and Canadian Pacific Railroads. Their principal conclusion is that public ownership is not inherently less efficient than private ownership, and that the oft-noted inefficiency of the government enterprises stems from their isolation from effective competition rather than public ownership, per se.

The Canadian experience has important implications for policy. While other experiences support the view that the lack of incentives associated with public ownership results in poor performance relative to private firms, the results of Caves and Christensen (1980) indicate that the impact of competition can be substantial and can conceivably offset the negative aspects of public ownership.

Equity is at least as important an impetus for public intervention as efficiency. The public sector alters the market-determined income distribution by providing transfers and merit goods. Many public sector undertakings seem to combine both equity and efficiency concerns. The question, however, is why should redistributive objectives involve the public sector in so much more than income transfers? And in any case, why is the public production of health services necessary in light of equity considerations? This is hardly the place to comment on the paternalistic underpinnings of the multidimensional transfer system that has been stitched together around the concept of merit goods, but the issue need not be entirely avoided, either. The advocates of increased private sector participation (see, for example, Heald and Steel, 1986; Chamberlin and Jackson, 1987; Poole and Fixler, 1987; Ramanadhan, 1989; and Griffin, 1989) propose several alternatives to public provision of merit goods: contracting for the production and management of the various public goods, and providing vouchers for the purchase of goods and services of different values for the different classes of the population.

3.3 PRACTICAL PROBLEMS WITH INCREASING PRIVATE PARTICIPATION

One objection to an increased reliance on the private sector is that the private sector may pursue different objectives than the public sector. If the private sector is monopolistic, or there are large informational barriers, then private monopolies may provide too much or too little quality. The concern with health care is that too little quality will be provided and access to care may not be adequately ensured by private providers.

Quality control, according to Poole and Fixler (1987), requires the writing of better contract specifications and the maintenance of proper contract monitoring once the contract is under way. In addition, performance bonds may be called in where contractors do not meet their required specifications. Such prescriptions are likely to be adequate for only a very limited range of goods and services. As Sappington and Stiglitz (1987) argue, this may be precisely where the problems of private contracting lie. The more complex the product, the more complex and uncertain the technology, the harder it is to specify, measure and monitor the output, and the higher the transaction costs of the contract. For example, since it is difficult to specify all of the health care quality dimensions, it might not be feasible to contract out health services.

It is perhaps for this reason that although the scrapping of the publicly-funded social security system in the U.S is suggested from time to time, it has not found many supporters. Laurence Kotlikoff (1987) argues for both public financing and public provision of a social security system. His case seems to have three elements: paternalism, the need to act for all the myopic, misinformed, miscalculating, and lazy households; market failures, the absence of a complete private annuity market due to problems of adverse selection and moral hazard that the government can overcome

by requiring complete universal coverage and pooling good and bad times across generations; and self-serving altruism, as distinct from state paternalism or caring for the welfare of our neighbors. Kotlikoff shows dramatic calculations indicating that in the absence of the social security system, for the retired population which has no pension benefits, 65 percent would face a 50 percent or more reduction in their standard of living.

Griffin (1989) lists several problems that would have to be overcome in order to achieve successful private sector participation in the health sector in developing countries. First, it would require the development of third-party payment systems and re-evaluation of the government's role in exactly the area where the government is most heavily involved. Governments willing to move some curative activities into the private sector could retreat to the simpler and more appropriate tasks of financing and regulating health care delivery. Third-party payment mechanisms, Griffin argues, can provide benefits not only for patients and providers, but can also ease the government's regulatory burden and make its quality control activities more effective. Second, there is the administrative problem in that management, accounting, and budgeting procedures would have to be improved. Third, some patients would continue to be subsidized by the government. This is perhaps unavoidable, since in developing countries a large percentage of the population would fall into the category of the needy. In addition, the socio-political and legal environments would need to undergo a change. This is potentially a major hurdle, since it would call for a major shift in current thinking and perception.

3.4 PRIVATE SECTOR AND EFFICIENCY CONSIDERATIONS

Clearly, the arguments for public intervention are more subtle and complex than can be encompassed in the summary categories of efficiency, market failures, equity, and income distribution. Market failures offer only an imperfect guide to whether or not governments should intervene. Whether one takes Richard Nelson's (1987) view that market failure is so pervasive that it provides little or no guidance, or whether one agrees with the perspective of Gerald Faulhaber (1987) that market failure, although an important screen, is by no means a sufficient ground for public intervention, there appears to be agreement that explicit consideration should be given to whether the public intervention is an improvement over the non-optimal private state of affairs.

Because such evaluations have not been very common, and market failures have provided a casual rationale for many public interventions, there may indeed be considerable scope for private participation. For the most part, arguments for enhancing the role of the private sector look like pure efficiency arguments: public production can be replaced at lower cost by private production. However, any reorganization of service delivery has distributional consequences, even where the only intention is to achieve an efficiency improvement. The incentives of the producer, in particular the profit maximization imperatives of the private sector, make it more likely that there will be attempts to exclude higher cost activities such as health care for the sickest patients or education for handicapped children. These difficulties cannot be overcome simply by appropriate contract provisions or different-valued vouchers. As Sappington and Stiglitz (1987) emphasize, precision in contract specifications is often elusive and monitoring is difficult and expensive. As Chamberlin and Jackson (1987) argue, differential vouchers in a cost-containment environment may not be

adequate to cover differential costs. It should also be kept in mind that in a more cost-conscious environment, similar incentives to avoid dealing with high cost cases may also operate in the public sector.

Aside from several studies of the public and private trash collection, little is known about the real potential of promoting the private sector for cost reduction or improved service quality. Similarly, little is understood about how to avoid the possible diminution of quantity or quality that allegedly occurs in the push for private profits in sectors like health services, where consumers have little or no information or choice. Nevertheless, the competitive-bidding cost-minimization model is exceedingly attractive and has a substantial following.

In their analysis of institutional alternatives for public service provision, Chamberlin and Jackson (1987) emphasize the important role of rents and rent-seeking behavior in influencing the interests of the parties in preserving the present system and in its reform, as well as the efficiency and equity properties of the alternative organizational forms. The benefits of increased private participation will be realized to the extent that competition is increased. Without an increase in competition, the reorganization may simply transfer rents from public employees to private firms.

What critical assumptions are required for the efficient outcome to result? Are they likely to hold? If not, how do they affect choice between public and private producer? According to Chamberlin and Jackson (1987), in choosing between producing the good or the service internally or contracting it out, an important consideration for the public agency must be the likelihood that it will need to intervene, and the expected costs and benefits of intervention would require evaluation.

Dennis Yao (1987) calls for a much better understanding of the public decision making and production processes. It may be that current dissatisfaction with the public sector and interest in the private sector stems from just those factors that also are alleged to complicate private production: complex, difficult to agree upon, difficult to measure outputs; complex or not-yet-developed production processes; lack of competition; and the existence of substantial rents in the production system. Therefore, any reorganization would have to take into account the general economic environment. Often, in a competitive, cost-conscious environment, both the sectors may perform at the same level.

3.5 ALTERING THE PUBLIC-PRIVATE MIX IN THE HEALTH SECTOR

Despite the fact that problems of efficiency and inequality that demand the attention of governments pervade most health care systems regardless of the mix of public and private activity, it is tempting to offer simple alterations in the public-private mix in order to remedy the defects of the health care delivery systems. This would be a folly, since different country experiences indicate high success and failure rates with similar systems. Thus, Australia, France, Germany, and the United States have responded to the inadequacies of their domestic health care systems by pledging more public expenditure and more public regulation of the finance and provision of health care. At the same time, opposition political parties have advocated the redesign of their public sectors which

provide health care and the encouragement of the extension of private finance and provision. It is thus paradoxical that, because of the dominance of particular ideologies, liberal or collective, policymakers in different countries are adopting opposite policies, divestiture, and regulations to remedy the same problems in the health care market.

Yet such policies may not be effective. No government is likely to be able to avoid some obligation to provide health care to the various categories of the underprivileged at some satisfactory level. Again, all governments are concerned with the pursuit of efficiency and value for resources. At the same time, it is less than certain that the private solution to health care problems is likely to lead to the attainment of equity goals unless purposefully directed. The distribution of health services in a free competitive market, because it is largely determined by willingness to pay, is unlikely to lead to the attainment of the equity goals. Neither does it manifest adequacy in the pursuit of efficiency. As discussed earlier, monopolies and cartels lead to groups of providers having the market power to raise prices and affect to their own advantages the quantity and quality of the services they provide. As a consequence, the costs of health care are not minimized and the monopolies get surpluses on some or all of the services they provide. Furthermore, since the monopolies provide services whose benefits may be consistent with their own preferences rather than those of the patients who are in their care, the distribution of these services in a free competitive market is unlikely to lead to the attainment of the equity goals because it is partially determined by willingness to pay.

The paradoxical result appears to be that private markets do not necessarily achieve the objectives of the proponents of free enterprise and can be at variance with the achievements of the goals of the public-sector apologists. Public activity in health care markets has failed to meet the objectives of the paternalistic state; alterations in the public-private mix are therefore called for, and existing structures, public and private, financial and provider, require closer scrutiny than has hitherto been given.

3.6 THE PRIVATE SECTOR AND THE PUBLIC HOSPITAL

In at least one opinion (Bovbjerg, Held, and Pauly, 1987), an area in the field of health care which is not open exclusively for the private sector is the public hospital. Despite evidence of an increasing interest in giving public hospitals over to private management, selling them to private firms, or closing them entirely, Bovbjerg, et al., (1987) argue that a continuing need exists in the United States for the public hospital to provide care for the growing number of persons not covered by existing insurance. Their argument for public hospitals rather than subsidy of private production of charity care in the U.S. is that the public is not willing to cover the private costs, but the public hospital is especially suited for rationing public care.

This appears to be the inverse argument of the benefits of private versus public production, which is partly based on the observation that governments in developing countries spend an inappropriately large percentage of their budgets on hospitals, which are an expensive but essential part of modern health systems. Griffin (1989) argues that governments can reduce this problem by charging user fees, but this is often difficult and politically unacceptable. A more feasible alternative appears to be to remove the hospitals financially from government budgets. In this opinion, therefore, one area of greatest potential for private sector involvement in developing countries is hospital care. In any case, the Bovbjerg, Held, and Pauly (1987) argument in favor of the public hospital providing care to the underprivileged cannot be overlooked, especially in developing countries where the proportion of the underprivileged is quite high.

3.7 PRIVATE SECTOR AND HEALTH SERVICES: COMPETITION OR REGULATION?

Most economists are in agreement about the important role that competitive markets play in inducing enterprises to operate efficiently. The theory of competitive markets shows that, under familiar conditions, both productive and allocative efficiency are achieved. The theory is supported by empirical evidence, which has analyzed the introduction of competition into markets where previously it was prohibited, and has compared the experience of otherwise similar markets, in some of which competition is restricted, and in some of which it is not (Bailey, 1986; Call and Keeler, 1985). This seems to suggest that the notion that the private sector operates efficiently will be borne out only in a competitive environment, and governments should therefore take steps to make the private for-profit health sector for individual services as competitive as possible.

However, there are significant constraints that may prevent the introduction of competition in the health sector. These constraints may be economic, political, or institutional in nature. Economic constraints arise because the health sector is typically characterized by market failures. This assessment suggests that the task of "regulation" can be divided into two parts: promoting competition where feasible, and preventing the misuse of monopoly power where it is not. This is clearly an oversimplification, and the two really overlap in practice. The first involves identification of the economic constraints on competition and development of policies to minimize their effect; the second involves identification of the potential misuse of market power and formulation of regulatory controls to inhibit these abuses. For the purposes of expositional clarity, we reserve the term "regulation" to refer to control of monopoly power and its obvious consequences.

Basic economic theory suggests that market structure can usefully be defined in terms of the number of buyers and sellers engaging in a transaction. But the application of this approach to the market for hospital services in countries with well-developed private insurance systems is complicated by the recognition that transactions typically involve more than two parties. While the patient is in a sense the buyer of the hospital services, his private or public insurance generally pays most of the bill. And the patient's decision to purchase services is clearly influenced by the recommendations of his physicians. Moreover, as Salkever (1978) suggests, since physician and hospital services are purchased jointly, the physician's role on the seller's side of the market needs to be considered as well. These unusual institutional features of the market for hospital services have important implications for a discussion of market structures. The functions of insurers, for

example, need not be strictly limited to the collection and disbursement of funds. If they enter into direct contractual relationships with hospitals and negotiate with them over the cost and nature of services to be provided to their policyholders, their influence on the buyer's side of the market cannot be disregarded. The same can be said of the physician whose own preferences may influence the recommendations he makes to his patients. Furthermore, the joint purchase of hospital services implies that the structure of the market for physician's services may influence the degree and nature of inter-hospital competition.

Salkever (1978) is therefore of the opinion that while a change in financing arrangements is probably the most powerful way to influence competitive behavior, other structural changes may have at least marginal effects. For example, ending restrictions on proprietaries and increases in the availability of information on costs may generate slightly more price competition. Open-staffing arrangements for use of highly specialized equipment could perhaps diminish competitive pressures for every hospital to offer a full range of services, although the inconvenience of hospitalizing patients at many different institutions argues against this. Alternatively, closed staffing may be necessary if there is competition in the medical plan market (i.e., according to Joseph P. Newhouse, Director of the Division of Health Policy Research and Education, Harvard University, the medical plan may find it advantageous to contract with a group of providers that gives it the best deal).

However, there may be several circumstances in which a competitive environment is not brought about, and the private sector is unresponsive to changes in demand. For instance, the individual practitioner may be a member both of the government facility and the private sector; he can then conceivably create a shortage in the public facility and generate demand in the private sector. Moreover, the creation of more competitive markets may be hindered by several factors. The present high degree of seller concentration in many local markets may be due largely to economies of scale, and thus not easily diminished. In such cases, minimum quality regulation can impede competition. The creation of more competitive markets further implies a need to develop new financing mechanisms for various public goods and community services, such as stand-by capability for emergency care, clinical training of health professionals, etc. The transition to a more competitive market for hospital services is not a simple matter. It involves a series of major institutional changes whose feasibility and desirability must be carefully examined.

Policy problems in health care systems, whether they are of an efficiency or a distributional nature, are by and large similar across most of the less-developed countries. Differences in institutional structure do not remove the need for the public and private decision makers to regulate prices, quantities, and quality provided in health care systems. Most health care delivery systems have some common characteristics: monopolistic markets, the primacy of the physicians in making the critical decisions about resource allocation, and the imperfections of both public and private funding arrangements, to list just a few. Maynard (1982) points out that the abolition of the monopoly power of the profession will be difficult to implement because it will involve substitution of cheaper labor inputs and create unemployment and reduce incomes among professionals. The effects of market incentive schemes, such as fee-per-item of service payments, may induce inflation and make budget limitations difficult to attain.

These inadequacies make the regulation of all health care inevitable. The nature of this regulation, however, needs clarification. Regulation usually carries with it the implication of action by the state. This is unfortunate, because regulation has a wider connotation in that it really means that activities will be controlled by or moderated by rules. The acts of control and moderation can thus be exercised by public or private bodies and an important issue is the extent to which the regulation bears on the individuals, providers, and the profession. As Mclachlan and Maynard (1982) note, the private sector can be regulated by rules devised both within that sector and from outside, by the state. Similarly, the public sector can be regulated and controlled by rules created within the sector, or devised by private bodies.

Mclachlan and Maynard (1982) define regulation of health care markets to mean that public and private bodies will seek to control or moderate the effects and outcomes of the non-competitive private sector and the often monopolistic public sector. The control of these bodies will be directed at moderating the activities of decision makers and influencing the price of services, labor, and capital and the quality and quantity of these services.

Since the erosion of market forces is unlikely to be reversed, public regulation becomes the inevitable second-best alternative. But regulation is not all of a kind, and several variables influence its effectiveness. Conventional planning and regulatory exercises often fail because they focus on constraining only the outputs of the medical-care system. They tend to assume simple motivations for the regulators and ready compliance by those regulated, ignoring the powerful and contrary incentives that an open-ended reimbursement system may offer to both the groups. In contrast, Altman and Weiner (1978) argue that the effectiveness of regulation can be greatly enhanced by a strategy explicitly designed to change those incentives which influence hospitals, physicians, and local regulators.

We return to a discussion of incentives in the next section, but note that if the key to regulatory effectiveness is an explicit organizational strategy that concentrates on behavior within the hospitals, then the objective for the regulatory agencies becomes organizational change. Rate regulation becomes a means not for actually setting prices, but for shifting the incentive structure for some of the professionals and administrators within the hospital. This, in turn, can potentially shift the balance of power on the numerous detailed decisions made within the hospitals that aggregate to cost growth that no planning agency can process individually.

Lastly, we note that with an expanding private sector, the regulatory actions of the government will have to be modified accordingly, for control over costs and quality standards will now become critical. The degree of regulation and monitoring cannot, however, be established generally, and will vary from country to country, and within each country, from situation to situation. In any case, some government monitoring of quality is likely to be necessary in developing countries to prevent untrained people from providing incorrect or harmful treatment, or unscrupulous providers from recommending services which are not needed, or charging exorbitant prices for necessary services over which they have a monopoly.

3.8 PROVIDER INCENTIVES AND DELIVERY OF HEALTH CARE

In this section, we discuss the role of provider incentives in health care delivery in developing countries. An exhaustive survey of this issue has already been undertaken in a companion paper (see Bitran and Block, 1992) and we have tried not to repeat the arguments and case studies presented in that review. What follows, therefore, is only a statement of the problem from a different perspective.

Glaser (1970) lists a number of desirable features of a payment system for physicians. According to him, the payment system should provide the necessary incentives for the members of the profession "to apply their knowledge and skills for the solution of society's problems in their areas of expertise, in accordance with the precepts taught by their professional schools and other institutions." Moreover, the payment system for physicians should (a) have built-in mechanisms for recognizing and rewarding outstanding work; (b) incorporate the necessary incentives to induce the physician to learn and apply the latest techniques; (c) ensure that an adequate number of qualified people enter the profession; (d) ensure that there are incentives for physicians to practice in all parts of the country and among all social classes; and (e) be economical administratively for government as well as physicians.

Hospital incentives also have a potentially important role, especially in situations where the locus of decision-making and control rests with the hospital. We have earlier observed that conventional planning and regulatory exercises by the state often fail because they focus on constraining only the outputs of the health care system. They tend to assume simple motivations for the regulators and ready compliance by those regulated, ignoring the powerful and contrary incentives that an open-ended reimbursement system may offer to both the groups. The major alternative to health planning - economic regulation as a solution of market failure - often falls victim to the same ills. Traditionally, it has been believed that regulation is necessary where there are market structures, such as natural monopolies, where competition is likely to be inappropriate or ineffective. Here the injunction is to substitute a public utility regulatory approach for the imperfect market. The agency in such a situation usually defines its work as setting prices, quality standards, and conditions of entry. But this approach is insensitive to the pattern of incentives produced by the system and the impact on regulatory effectiveness. For instance, the early prospective reimbursement experiments in the United States have probably suffered from their reliance on a public utility strategy. The results of the practice of establishing prospectively set budgets have been mixed, at best. The various schemes have concentrated on establishing rate-ceilings rather than explicitly incorporating into the control system appropriate incentives for behavior change within the hospitals.

While the key to the effectiveness of a health regulation system is its capacity to stimulate changes in the behavior of physicians and hospital personnel, we really know little about how to accomplish this end. It would be desirable to have profiles of the specific incentive structures within the hospitals that motivate provider behavior, and to be able to link our micro theories of behavior and our macro theories of regulation to assess the specific impact of different regulatory schemes on internal incentives. We leave this exercise for Phases Two and Three of our research.

Industrial organization literature is rich with considerations of the incentive problem. Orthodox economic thinking has treated firms as economic agents with the sole objective of profit-maximization. Increasingly, however, the modern corporation is characterized by a separation of ownership, management is being considered more seriously, and attention is now being focused on managerial objectives. It is generally argued that a manager's objective depends on the structure of the incentives that the firm's owner designs to motivate him. This motivation usually comes about by indexing managerial compensation to profits, sales, quality, output, and many other variables.

The relationship of agency is one of the commonest codified modes of social interaction; the agency relationship is when one person (the agent) acts and takes decisions on behalf of another (the principal). Essentially, all contractual arrangements (as between the government and employees of a state health facility) contain important elements of agency.

The owner-manager relationship can be described as a standard principal-agent problem. The principal-agent approach (see, for instance, Ross, 1973; Holmstrom, 1977; and Harris and Raviv, 1979) assumes that "a principal chooses an incentive structure for agents which maximizes his welfare subject to information constraints and adequate compensation for the agents" (Fershtman and Judd, 1978).

The analysis of the principal-agent problem has been carried out in one-period models (see, for instance, Laffont and Tirole, 1986; and Fershtman and Judd, 1987), as well as in multi-period models (see, for instance, Laffont and Tirole, 1987, 1988; and Baron and Besanko, 1984, 1987). A study of dynamic relationships is more pertinent in principal-agent problems in health care in developing countries where the governments have to balance the twin (and at times, conflicting) objectives of, on the one hand, obtaining the desired input from the hospital physicians using a judicious mix of incentives, and, on the other hand, ensuring that the physicians remain in hospital employment. Laffont and Tirole study a simple two-period principal-agent model in which the principal updates the incentive scheme after observing the agent's first-period performance. The principal cannot observe and monitor the effort put in by the agent, but can observe some measure of the agent's first-period performance. The relationship is entirely run by short-term contracts. In the second period, the principal updates the incentive scheme and the agent is free to accept the new incentive scheme or to quit. Stiglitz and Weiss (1987) apply a similar incentive structure to the credit market and analyze the relationship between banks (the principals) and the borrower-firms (the agents).

Holmstrom and Costa (1986) show how career concerns rather than effort-aversion can induce a natural incongruity in risk preferences between managers and owners. They develop a model based on managerial learning to study second-best contractual remedies. This model would suggest that appropriate incentives can be drawn up to incorporate career inducement, especially in developing countries where multiple job-holding by government physicians is a problem.

This section is not meant to be a review of industrial organization literature on the principal-agent problem; indeed, a review of this nature would be an enormous effort by itself. Instead, the few examples that have been given are purported to give a flavor of the basis of future research

efforts designed to study the role of incentives in production and delivery of health care in developing countries

3.9 THE DEVELOPING COUNTRIES' EXPERIENCE

The proportion of health expenditure that is private is quite high in many developing countries, indicating the existence of an active private sector alongside public provision of health care. Private health expenditure as a proportion of total health expenditures is more than 50 percent in many developing countries like Afghanistan, Argentina, Bangladesh, Ethiopia, Ghana, Haiti, Honduras, India, Indonesia, Kenya, Mali, Pakistan, the Philippines, Swaziland, Syria, Uruguay, Venezuela, and Zambia. (It is interesting to note that private health expenditure as a proportion of total health expenditure tends to be much lower than 50 percent in most developed countries; one exception is the United States where this ratio is closer to 60 percent.) Private health expenditure is less than 50 percent in Bolivia, Botswana, China, Colombia, Ecuador, Jamaica, Lesotho, Malawi, Mexico, Paraguay, Peru, Senegal, Sri Lanka, Sudan, Tanzania, and Thailand, (de Ferranti, 1985; Akin, 1987; Lewis, 1988; and World Bank Country Studies). To the extent that data on consultancy fees of private physicians is not accurately available in most developing countries, these figures are conservative; actual expenditure on private health care would perhaps be much higher.

As we have discussed earlier, greater involvement of the private sector would lead to increasing interactions between the public and private sectors. The outcome of these interactions may be desirable or not, depending on the extent to which they impact on the policy objectives of any given program. In this section, we examine some of the existing interactions in the health sector in developing countries due to the co-existence of the public and private sectors. Unfortunately, few instances of these interactions are documented in health economics literature or in the policy or appraisal papers of the developing countries. Yet, this line of examination is important, for it throws some light on the nature of interactions that can be expected with promotion of the private sector. We therefore contacted a large number of researchers and government administrators in an attempt to document some examples of public-private interactions in the health sector. On the basis of their verbal descriptions of experiences and country knowledge, we compiled a list of existing interactions and mechanisms employed by different countries to address the undesirable aspects of these interactions. These vignettes are presented in the form of exhibits. Exhibit 1 summarizes country experiences of interactions in the health sector. Exhibit 2 lists mechanisms developing countries have attempted to influence the public-private mix in the health sector. These exhibits do not purport to contain an exhaustive list; rather, these vignettes are illustrations of the extent of the outcomes of interaction.

EXHIBIT 1

COUNTRY EXPERIENCES WITH COEXISTENCE OF PUBLIC AND PRIVATE SECTORS IN PROVISION OF HEALTH CARE

AREA OF INTERACTION	COUNTRY EXPERIENCE
Sharing of human resources by the two sectors: legal private practice by government physicians	<p>Banqladesh, Egypt, and Pakistan: Private practice "accepted" although not legally permitted.</p> <p>India: Private practice legal in most states.</p> <p>Israel: Physicians allowed to visit patients at home, although there are some restrictions.</p> <p>Indonesia: Private practice permitted.</p> <p>Mexico: Private practice encouraged by the government in rural areas.</p> <p>Mozambique, Tanzania: Laws prohibiting private practice repealed.</p>
Sharing of human resources by the two sectors: moonlighting by government physicians	<p>Brazil, Dominican Republic, Ivory Coast, Nigeria, Sao Paulo, Sudan, Sri Lanka, Venezuela: Private practice not legally permitted; evidence of moonlighting by government physicians.</p> <p>India: Private practice not permitted in some states; evidence of moonlighting by government physicians.</p>
Evidence of queue-jumping	<p>India, Israel: Evidence of queue-jumping by private patients in public facilities.</p> <p>Sri Lanka: No evidence of queue-jumping.</p>
Evidence of different quality of care	<p>India: Patients perceive better quality of care in the private sector for most procedures, although prefer public facilities for procedures involving high technology.</p> <p>Egypt, Israel, Kenya: Evidence of superior quality of care in the private sector.</p> <p>Almost All Countries: Private care more "personal" than available in public facilities.</p>
Urban-rural differences	<p>Egypt: Most physicians concentrated in urban areas.</p> <p>Banqladesh, India, Pakistan: Government health care personnel posted to rural areas, but do not take up the post. Few non-government physicians, except traditional practitioners, available in rural areas.</p>

EXHIBIT 1 (cont.)

AREA OF INTERACTION	COUNTRY EXPERIENCE
Evidence of pilferage of drugs	<p><u>Banqladesh, India, Kenya, Pakistan, Zimbabwe:</u> Anecdotal evidence indicates pilferage of drugs from government facilities.</p> <p><u>Sri Lanka:</u> Pilferage reported to be uncommon.</p>
Sharing of hospital infrastructure by the two sectors: legal arrangements	<p><u>Indonesia, Mexico, Tanzania, Zimbabwe:</u> Separate pay wings in public facilities; private patients permitted to avail, on payment, of facilities in public hospitals.</p> <p><u>India:</u> Private pay beds in government hospitals, but patients have to be treated by government physicians only.</p> <p><u>Iran, Mozambique:</u> Government physicians permitted to meet private patients in selected facilities.</p> <p><u>Nigeria:</u> Government physicians permitted private practice in public facilities; some restrictions apply.</p> <p><u>Sudan:</u> Government physicians permitted night-time private practice in some public hospitals.</p>
Sharing of infrastructure by the two sectors: informal arrangements	<p><u>Banqladesh, Egypt, Israel, Kenya:</u> Informal and "free" use of facilities in public hospitals by private patients.</p> <p><u>India:</u> Even though sharing of other infrastructure prohibited by law, evidence of "misuse" of pathological and radiological facilities in public hospitals by private patients.</p> <p><u>Sri Lanka:</u> Private patients sometimes pay rent for using public equipment; sharing arrangements largely informal.</p>

EXHIBIT 1 (cont.)

AREA OF INTERACTION	COUNTRY EXPERIENCE
<p>Physicians' allocation of time between the two sectors</p>	<p>India: Physicians spend mornings and afternoons at the public facilities, and evenings at their private practice. Indonesia: Physicians devote mornings to private practice. Israel: Physicians spend only mornings at the public facility; spend evenings at their private clinics. _____ Physicians spend only mornings at the public facility; afternoons and evenings are devoted to private practice. Philippines: Late afternoon private practice by government physicians. Sudan: Physicians do private practice at night.</p>
<p>Self-referrals of public to private practice</p>	<p>India, Israel: Self-referrals of public physicians to their private practice common.</p>
<p>Physicians' preference for public sector employment</p>	<p>Almost all Countries: Physicians choose public sector employment for any one or more of the following reasons: security of a salary, prestige, contact with prospective patients, ability to offer private patients access to the public facility, and gaining wide experience.</p>
<p>Private sector-like incentives in public hospitals</p>	<p>India: Non-practicing allowances given to physicians not allowed to practice in some states.</p>

EXHIBIT 2

COUNTRY EXPERIENCES WITH MECHANISMS TO REGULATE THE PRIVATE SECTOR

REGULATION MECHANISM	COUNTRY EXPERIENCE
<p>Regulating private practice by government physicians</p>	<p>India: Many states sought to ban private practice, but the physicians obtained court orders in favor of allowing them private practice as a matter of right.</p> <p>Ivory Coast: Government offered amnesty to all government physicians who had private practices, and offered them a choice to work in either of the two sectors. As an incentive, government increased salaries in the public facilities. Almost all physicians opted for public employment, took the benefit of higher salaries, and resumed private practice.</p> <p>Mexico: Private practice encouraged by the government in rural areas.</p> <p>Mozambique, Tanzania: Law prohibiting private practice repealed.</p> <p>Nigeria: Government considering permitting private practice by government physicians in public facilities.</p>
<p>Encouraging private sector involvement in health care: tax reliefs</p>	<p>India: Tax reliefs to private physicians setting up medical research centers and private hospitals; certain restrictions apply.</p> <p>Malaysia: Government considering ways of encouraging private health insurance in rural areas by offering tax reliefs to the insurer.</p> <p>Nigeria, Indonesia: Non-profit hospitals and other institutions get tax-relief on earnings.</p> <p>Zimbabwe: Tax relief for traditional practitioners.</p>
<p>Encouraging private sector involvement in health care: services contracted out to the private sector.</p>	<p>India, Indonesia, Bangladesh, Pakistan: Laundry, and catering.</p> <p>Malaysia: Security, trash disposal, laundry and catering.</p> <p>Sri Lanka: Security and laundry.</p> <p>Nigeria: Laboratory services.</p> <p>Mexico: All non-clinical services.</p> <p>Zimbabwe: Insurance accounts, equipment maintenance, and laundry.</p>

EXHIBIT 2 (cont.)

REGULATION MECHANISM	COUNTRY EXPERIENCE
Encouraging private sector involvement in health care: promoting private insurance.	Chile, Malaysia: Government considering ways of encouraging private health insurance in rural areas.
Encouraging private sector involvement in health care: involving the private sector in preventive care.	India, Indonesia, Iran, Nigeria: Government supplying free vaccines to the private hospitals and clinics for onward free disbursement to their contact population. India, Nigeria, Zimbabwe: Distribution of condoms through the private sector; condoms were earlier made available free of charge in India, but this scheme was discontinued when studies showed that the use of condoms would go up only when they had to be paid for.
Regulating the private sector: supply of physicians.	India, Iran: Government mandates an initial bonding period to the public hospital; this period is 2-5 years in India, applicable only to graduates from government schools, and 5-10 years in Iran.
Regulating the private sector: licensing requirements.	Almost All Countries: Private facilities are licensed in almost all countries.
Regulating the private sector: quality control.	India: No formal mechanism for quality control; inspections carried out by the various government departments, like sanitation, building safety, etc. Nigeria: A professional body appointed by the government to monitor quality. Sri Lanka, Zimbabwe: Health Professional Councils entrusted with the task of monitoring quality.
Regulating the private sector: accessibility conditions.	India, Iran, Indonesia: Certain percentage of beds reserved for poor patients; in India, mandatory for a private hospital to have "general" wards for poor patients.

These exhibits are based on verbal descriptions of country experiences as recounted by Adel Abadeer, J.L.Akin, Peter Berman, Jacob Glazer, Charles Griffin, Maureen Lewis, Mohua Mukherjee, and Mead Over. We have also drawn upon our own experiences and country knowledge. Finally, the documented sources used are Lewis (1988): “The Private Sector and Health Care Delivery In Developing Countries: Definition, Experience, And Potential,” and the 1992 summary report of World Health Organization-sponsored interregional meeting on “The Public/Private Mix in National Health Systems and the Role of Ministries of Health.”

3.10 LESSONS FROM THE EDUCATION SECTOR

Since the problems and issues facing the health care delivery system are similar in many ways to the production of education services, useful insights can be gained by examining the role of the private sector in the education sector. The arguments for public education are also founded on an exceedingly complex underpinning of efficiency and equity goals. Nonetheless, there are many proposals for increasing private sector involvement. As Henry Levin (1987) argues, the climate favoring the greater introduction of private alternatives in elementary and secondary education arises from a general belief that the public schools are not doing a very good job and that private schools provide a better education at a lower cost, arguments that are similar in nature to those for reducing the role of the public sector in health services.

Aside from revenue mobilization, one of the arguments for allowing the private sector to assume a larger role in the provision of education is that it would increase efficiency as administrators become more responsive to the needs of the students and their parents. But what is the empirical evidence regarding the relative efficiency of private and public schools? In the United States, the Coleman, Hoffer, and Kilgore (1982) report concluded that attending private schools increased the performance of students as measured by standardized tests of verbal and mathematical skills. Although there are reservations of selectivity bias and the magnitude of effects, the conclusion that the average student does better in private than in public schools is widespread (Hanushek, 1990). Similar results hold in developing countries, too. In a comparative study of two school populations in India, Kapur (1991) found that the private school students outperform their public school counterparts in standardized tests of language and mathematics. Based on case studies that compare private and public secondary education in Colombia, the Dominican Republic, the Philippines, Tanzania, and Thailand, Jimenez, Lockheed, and Paqueo (1991) find that private school students generally outperform their public school counterparts on standardized mathematics and language tests. In addition, preliminary evidence suggests that unit costs of private schools are lower than that of the public schools. Although these arguments can by themselves not be used for proposing an increased role for the private sector, they certainly do indicate that the governments should reconsider policies that restrain private sector participation in education. In addition, an implication for policy is that public schools could emulate at least some teaching and administrative practices of their private counterparts. For the health sector, the parallel policy implication is that public sector hospitals would perhaps be better off following some of the management practices of the private sector.

Albert Shanker (1987) argues that much of the traditional argument for public schools turns on their roles as producers of social goods, but finds no evidence in developing countries which confirms that they in fact do so. Anita Summers (1987), however, contends that evidence to the contrary notwithstanding, the belief in public schools as producers of social goods is well-entrenched and will remain a central element of educational reform. This seems to be true for the health sector, too, where in spite of the realization that the private sector has an important role to play in the delivery of health care, the role of the government is still seen as large, and, in some sectors, critical.

3.11 PRIVATE INVESTMENT POTENTIAL IN DEVELOPING COUNTRIES

It is pertinent at this stage to examine the availability of private investment in developing countries. Pfeffermann (1988, 1991) shows that while total investment rose in developing countries between 1970 and 1980, it started declining in the 1980s. Private investment was substantially higher than public investment initially, but public investment grew faster than private investment during the 1970s and early 1980s. Private investment began to recover somewhat after reaching its low point around 1985-86. Overall private investment exceeded public investment throughout the 1970s and 1980s.

Regional trends indicate that private investment has been higher than public investment throughout the period in East Asia and, to a lesser extent, in Latin America. In South Asia, public investment slightly exceeded private investment throughout the period under consideration. In the African countries, private investment was higher than public investment until 1980; the share of public investment then increased as private investment declined as a percent of GDP, to the point where over 60 percent of investment is now public, the highest proportion for any region.

Recent country trends indicate a rising private investment as a percent of GDP in Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, Guatemala, Hungary, India, Indonesia, Kenya, Mexico, Nigeria, Peru, Portugal, Thailand, Turkey, and Uruguay. Falling trends are reported in Bangladesh, Malaysia, Philippines, and Tunisia. Countries like Pakistan, Singapore, Zimbabwe, and Zambia exhibit steady private investment/GDP ratios.

The data provide some insights into private sector potential, as well private sector reactions to expansion of public investment. Pfeffermann (1988) concludes that the data do not support the hypothesis that rising public investment tends to discourage private investment, a form of "crowding out," nor do they show consistent evidence of positive linkages between the two. Rather, the suggestion is that the direction of change will depend on country circumstances, including the state of private sector confidence.

Economic policies can be conducive to private investment or they can be inhibiting. Pfeffermann (1991), basing his analysis on the private investment data published by International Finance Corporation, highlights some of the most important factors that influence levels of private investment in developing countries. The factors which unambiguously affect private investment positively are growth in demand and availability of financing. For instance, while demand for

health services is increasing steadily in developing countries, the availability of finance is clearly a policy measure. There are also a number of factors which have an unambiguously negative impact on private investment. These are fiscal deficits, the volatility of inflation, and exchange rates.

Marsden and Belot (1987) address key issues affecting private sector development in Africa. They focus on five areas which they categorize as critical to healthy development of the private sector. These are barriers to entry, treatment of foreign investment, financial constraints, labor policies and price controls, and trade policies and competition. They conclude that although these distortions and weaknesses are being removed in some African countries, far more concerted efforts need to be made for promotion of the private sector in most of the continent.

The challenge then is to create a better environment for private enterprise. Development in many countries throughout the world has shown that the initiative and drive of private investors and entrepreneurs can be important to economic growth. Economic analysis suggests that private enterprises contribute most to the generation of high economic returns in a liberal environment characterized by few constraints on access to inputs and markets, autonomy in investment and operating decisions, and a common framework of incentives applied constantly and uniformly to all actors.

3.12 CONCLUSION

Promotion of the private sector in the production and finance of health services in developing countries appears to be a desirable alternative, given the general financial constraints being faced by most developing countries. However, the experience of some of these countries seems to indicate that the ensuing public-private interactions may not always be optimal; there appear to be as many areas of conflict as of cooperation. While there can be no general prescription for all countries, given the vastly different socio-political conditions, it is clear that any conscious promotion of the private sector would have to take into account both the positive and undesirable features of public-private interactions.

4.0 CONCEPTUAL MODEL OF PUBLIC-PRIVATE INTERACTIONS

This chapter provides a conceptual framework for possible analysis of public-private interactions in developing countries. The chapter is organized into two sections. The first section provides an organizational approach to thinking about which services are most appropriate for provision by the government sector. This section builds upon three insights:

- ▲ Arguments for public financing of health services should be separated from arguments about public provision.
- ▲ One of the most important forms of public-private interactions is the explicit or implicit decision about which services are to be financed or provided by the public sector.
- ▲ Allowing some use of public resources (either physicians, staff, or facilities) for private provision of services may be an attractive strategy.

The second section of the chapter provides an analytical model of multiple job holding by health personnel in developing countries. The section begins by discussing the widely noted observation that health personnel in public facilities often spend a substantial proportion of their time seeing private rather than public patients. We then develop an analytical model of the physician's allocation of time between the public and private sectors. This formal model is used to derive behavioral equations of physician behavior and then used to prove five propositions concerning the response of physician's time allocation to changes in policy instruments that influence it. The second section ends by specifying an empirically estimable model of physicians' time allocation and suggests the variables necessary to be collected. Various "sample selection" models are proposed that would permit us to model the two key interrelated decisions: whether or not to work outside of the public sector, and, if so, how many hours to work in that sector. The model builds upon recent modeling efforts from the labor economics literature. This specification is very preliminary; details would need to be worked out should the specification be implemented empirically.

4.1 ORGANIZATIONAL FRAMEWORK FOR PUBLIC VERSUS PRIVATE PROVISION

There is extensive literature on the advantages and disadvantages of public versus private provision of health services, some of which has already been discussed in the preceding literature review chapter. Despite this, we believe that there are still important insights to be made. This section is organized into four subsections, which address the following questions:

- ▲ What is the economic rationale for public sector involvement in health care services?
- ▲ What explains the widespread practice of public provision of health services rather than public financing of health services?

- ▲ For what specific health services is the argument for public financing and provision of health services the strongest?
- ▲ What are the efficiency and cost implications for health production of shared versus sole ownership of resources?

4.1.1. Why Public Involvement?

The issue of why the government is involved in the provision or financing of health services is a perennial topic of discussion and must underlie any consideration of which services to cover and how much coverage to provide. Barnum and Kutzin (1990) provide a useful and recent discussion on this topic. Traditionally, three economic arguments are made for government involvement. One is that health services have characteristics of public goods, which is to say that the benefits of one person's consumption of health care extend beyond the individual and benefit the entire public. Vaccinations and control of infectious diseases are the clearest examples of health services with large public good characteristics. The second argument is that there is a market failure in the provision of health insurance, resulting from imperfect information, leading to too little health insurance being purchased. The third argument for public involvement is often stated as the desire to ensure equity of access. As Musgrove (1986) has highlighted, a perfectly equitable health care system would be one in which everyone has equal access to health care of the same quality for a given set of health problems.

While we do not wish to challenge the basis of these arguments for public involvement in the provision of health services, we would like to note that while the public good and imperfect information problems are pervasive across different countries and cultures, the importance attached to equity as a social concern is culturally defined and is likely the source of the greatest disagreement among policy advisors. Whereas in some countries there seems to be a widespread agreement that everyone is entitled to equal access to the identical health services (e.g., Sweden and Denmark), in other countries there is much less agreement. In the United States, it is probably reasonable to characterize the consensus view as that everyone should have access to "acceptable" rather than "equal" levels of health services. Public and private insurers in the U.S. almost always differentiate certain types of health services as being more meritorious of support (e.g., hospital services rather than dental care, surgery rather than drugs). Coverage of health care by the Medicare program in the U.S., for instance, is only imperfectly explained by concerns over the moral hazard problem (i.e., demand response) due to insurance coverage.

We feel that rather than emphasizing the equity of access to health services, it is more useful to emphasize that health services are often viewed as merit goods (i.e., goods about which people often feel altruism). It is clearly true that people in many cultures feel that food, clothing, and housing are merit goods, and that society should try to ensure access to "acceptable" levels of each of these goods. Yet relatively few cultures emphasize equity of access to all of these goods. Instead, large degrees of inequity are tolerated. These examples also highlight that the merit good dimension is independent of the public good dimension frequently associated with health services. The distinction between merit goods and equity is very useful when we differentiate health services

according to the degree of merit in a later discussion. It is also useful to acknowledge variations across cultures in the relative importance of merit goods argues for public involvement in health services production. (Anticipating objections that the "Health For All" initiative is primarily formulated in terms of "equity of access" rather than merit goods, we will point out that the services emphasized in that initiative [maternal and child health, primary and preventive care, infectious diseases, sanitation, etc.] are precisely those which we note have the strongest merit good argument.)

Offsetting the argument for public involvement in provision of health services are concerns about the relative efficiency of production of health services in the public and private sectors and the difficulty of raising revenue to pay for public services. These arguments have already been discussed earlier.

4.1.2. Public Provision Versus Public Financing

The preceding section has summarized the arguments for public involvement in the provision of health services. There is substantially less debate in the literature concerning the relative advantages of public *provision* versus public *financing*. Different developed countries have taken different approaches to this problem. For example, Canada has adopted the approach of substantial public financing of what is primarily a private delivery system, whereas Britain and Sweden have chosen the public provision strategy.

What are the reasons for preferring one approach to the other? It has rarely been emphasized in the literature that the public good arguments and market failure related to imperfect consumer information give no justification for public provision rather than merely public financing of health services. A social insurance system similar to Canada's could be used to finance the private delivery of public good activities such as vector control, immunizations, and sanitation. Similarly, the market failure of imperfect information that results in the underprovision of insurance against catastrophic expenses could in principle be overcome, as in Canada, by the public insurance coverage of private delivery of health services.

The argument for public provision rather than merely public financing of health services is the equity or merit good argument. The argument is that the private sector cannot be relied upon to provide adequate levels of merit goods without extremely close monitoring, and it is infeasible for the public sector to provide this close level of monitoring in most countries. Even in the U.S. and Canada, with highly developed information systems, it is difficult for the government or any large insurer to guard against fraud and ensure that services are being adequately provided to Medicaid patients or the uninsured. In developing countries, the monitoring costs are even higher: the absence of patient addresses and the costs of auditing and verifying the tremendous numbers of services provided would be a burden to the public sector.

This would seem to be the key insight for the very widespread observation that governments in developing countries are unwilling to contract with private providers for delivery of basic health services. In light of this observation,

efforts to encourage developing countries to promote efficiencies in the provision of health services similar to those achieved by the private sector will tend to fail unless one of the following occurs:

- ▲ Those countries are convinced to abandon their social objectives for equity and merit goods.
- ▲ Efforts are made to focus the encouragement of the private sector effort only on certain health services where the merit good argument is weak, or where monitoring is relatively easy.
- ▲ Systems of monitoring and incentives are improved in the private sector to ensure that equity or merit goods are adequately provided.
- ▲ Incentives at public facilities are changed so that they more closely mimic the efficiency of the private sector.

We believe that the first possibility is generally infeasible and unattractive. The second possibility is explored briefly in this section and is deserving of substantial further research. Much could be learned by studying countries where the public sector has focused its resources on "high merit" goods, rather than trying to finance or provide all types of health services. We intend to propose further research on this second possibility as part of our Phase 2 proposal.

The third and fourth possibilities are the most promising. Although many comparisons between the private and public sector have been made, there has been relatively little effort to study monitoring activities and incentives at public and private facilities. Bitran and Block (1992) have also identified this as an important topic of research, and identified very little existing work on the issue. Understanding the incentives facing public and private providers and examining monitoring systems should be subjects on which to focus proposed future research.

4.1.3. Which Services for the Public Sector?

The preceding discussion has highlighted that it may be useful to encourage the private sector to provide some of the services that are currently provided in the public sector in many developing countries. Services that are most appropriate for the private sector provision would appear to be the following:

- ▲ Services in which the private sector is relatively efficient compared to the public sector.
- ▲ Services with the smallest "merit good" component.
- ▲ Services for which the monitoring problem is severe in the public sector.

Barnum and Kutzin (1990) have already provided a discussion of which services are most appropriate to provide in the public sector. Not surprisingly, services recommended for public sector provision correspond closely to those having the highest merit good argument (primary care, maternal and child health, vaccines, vector control, sanitation, water quality). More research is needed in order to identify services where the public sector is particularly efficient or inefficient (i.e., which types of curative care? which drugs and medical supplies?).

Two examples will illustrate the usefulness of this approach. The first example concerns the provision of drugs. Although the provision of drugs is an area in which the public and private sectors may display similar efficiency and has moderately large merit good argument for ensuring universal access, the monitoring problem if provided in the public sector is quite severe. Because a very large number of small transactions are involved, monitoring is relatively costly. Although illegal in every country, there is anecdotal evidence from many countries that a significant proportion of public drug supplies are diverted to the private sector. Dunlop and Vian (1992) cite one estimate that an average of 20 percent (and perhaps as high as 60 percent in some cases) of the cost of drugs may be saved through a reduction of theft and pilferage in developing countries. In addition, they argue that rationalization of drug prescription practices, which may be more likely in the private sector, could save 50 to 70 percent. Unless incentives for efficiency in the public sector are improved, private provision of drugs (perhaps with public subsidies) would appear preferable to the existing expensive and inequitable distribution.

The second example concerns India's system of ensuring the provision of child health care services through the use of health cards for children under age five. This child health card system has been in place for over 25 years, and is generally viewed as being relatively successful in contrast to health card systems that have been introduced in numerous other countries and have often failed. India's system is a notable example of targeting public resources at a "high merit" group. Both public and private facilities cooperate in providing preventive child health services (like immunization, nutrition guide, frequent check-ups for communicable diseases like tuberculosis, leprosy, etc.) at no charge to the families. The vaccines are usually provided by the government to both public and private health facilities free of charge, and it is mandatory that the health facilities ensure the child-patient in their charge follow the strict immunization schedules. Monitoring is not difficult for children who were attended to at birth by health personnel; for the others, it is "customary" for the doctors of the closest town to set up biannual camps covering a cluster of villages and provide these preventive services in such camps. Whereas operational deficiencies can be found in a number of other health programs taken up by the government or other organizations, the success of preventive child health services cannot be questioned.

4.1.4. How Best To Share Public Resources

In addition to trying to target certain services to be provided by the public sector, it may be desirable to increase the effectiveness of the public sector. One way is to try to create incentives for the public sector to mimic the private sector. Bitran and Block (1992) are proposing to examine this key issue. Another approach, which forms the focus of our analytical and proposed

Phase 2 work, is to foster appropriate sharing of public resources between the public and private sector. Two forms of sharing of public resources are commonly observed:

- ▲ Private sector use of hospital beds, operating rooms, and other types of capital, and
- ▲ Sharing of physicians and other medical staff time between the public and private sectors.

Many examples illustrate the potential for improvements in the use of the public sector resources. In Nairobi, Kenya, the government's largest facility, Kenyatta National Hospital is being encouraged to set up and market highly profitable high-amenity, "private pay" bed wings. Profits on these patients are to be used to subsidize other services provided by the hospital. Separate pay wings are available also in Indonesia, Mexico, Tanzania, and Zimbabwe, where private patients can avail of facilities in public hospitals. In some other countries, like Sri Lanka, these sharing arrangements are largely informal. In most of India, public sector physicians are not allowed to see private patients during their normal eight-hour work day; the physicians spend evening hours in private practice. The majority of them are allowed to see private-pay patients during the evening hours. The favorable outcome of this arrangement is that fee income earned during these evening hours greatly augments the incomes earned by these physicians, and permits the government to pay much lower salaries than they would otherwise be allowed to pay. Hence it greatly leverages the government salaries, permitting them to have more physicians in the public sector than they could otherwise afford. The negative side of this arrangement is that physicians have incentives to self-refer patients to their private practice, the quality of public services may suffer due to the after-hours work of physicians, and public hospitals may not be used most efficiently (physicians must maintain two different offices, for instance). Similar arrangements are also found Israel, Kenya, Philippines, and Sudan, and with only a slight difference in Indonesia, where public sector physicians devote mornings to private practice.

We give these examples by way of showing that there is much to be learned by studying ways that the public and private sectors could more effectively share resources.

4.2 MULTIPLE JOB HOLDING BY GOVERNMENT HEALTH PERSONNEL IN DEVELOPING COUNTRIES

Despite its changing organization and technology, the mission of any government's health care delivery has remained the proper diagnosis and treatment of the patient from the best qualified physicians with the appropriate facilities and ancillary assistance at the right time. While this demands an appropriate combination of technical skill and humane understanding from the physician, it also necessitates a payment system which should motivate and reward the proper balance between volume and quality of work, between working to one's own limits and referring the patient to better qualified specialists, and, in developing countries particularly, continuing the supply of manpower to the profession. Glaser (1970) notes that the payment system of a profession should provide "the means and incentives for the members to apply their knowledge and skills for the solution of society's problems in their areas of expertise, in accordance with the precepts taught by their professional schools and other institutions. A payment system for physicians should supply the means and incentives to give each patient what is needed in diagnosis, clinical therapy, psychosomatic support, preventive medicine, and continuity of care. The payment system should motivate referral to the physician best qualified to do the job. Outstanding performance should be recognized and adequate work should be suitably compensated. The physician should be induced to learn and apply the newest effective techniques. The necessary number of qualified people should be induced to enter the profession, specialize in its various fields, and practice in parts of the country and among social classes where they are needed. A payment system should be economical administratively for both physicians and government. Conflicts, low morale, and interruptions of service should be avoided."

Of the many possible ways of paying physicians for medical care (see Section 2.4 for a brief summary), salaried methods of payment are preferred by many developing countries because of administrative convenience and the members of the profession prefer a certain source of earning to the vagaries of private practice. Salaries are paid for spans of time; if work during those hours increases or is slack, the physician's pay is unaffected. Salaried systems may therefore be vulnerable by not providing enough incentives for extra effort and omitting effective penalties for neglecting patient's needs. Moreover, salaried systems are not self-regulating, although salaries are usually paid to persons who work in organizations with rules and a hierarchical arrangement of positions. The structure and operation of the organization can, therefore, in theory at least, supplement the mechanics of payment by providing methods for reviewing the physician's performance, rewarding extra effort, and penalizing neglect.

This, however, is not how the system works in practice. Remuneration to award superior effort presents many dilemmas. The best incentive system must be individualized; since every person has a highly different set of motives and responses, payment should be designed especially for him or her. But labor agreements are typically collectivized and the pay rate standardized; incentive systems tend to disappear. Moreover, penalties for acts of omission are typically very infrequent, either due to the prevalent labor laws or out of genuine apprehensions of reprisals from the profession. The result is that, in many developing countries, physicians employed in government hospitals seek to establish their own private practice and typically put more effort into

this secondary employment. Consequently, not only do the public facilities therefore wear a deserted look after the out-patient treatment hours, even during the hospital working hours the attitude of the government health personnel is indifferent and their input unmotivated.

A severe problem in most developing countries is that most of the population is in the countryside while most of the doctors are in the cities. The official payment system is one of the reasons for the imbalance. In the absence of proper incentives, all the doctors live in urban areas where most of the private patients reside. For any physician requiring advanced facilities and sophisticated colleagues, working in the city has no alternative. Unless the salary system can be modified to include sizeable incentives for rural practice, it may unintentionally accentuate rural-urban imbalances.

This is where the role of incentives becomes important, for these policy instruments "can be used to influence the worker's behavior with the aim of narrowing the gap between the worker's performance and the desired performance" (Bitran and Black, 1992). A discussion of incentives will, however, be meaningful only if we have some idea of what actually motivates physicians in developing countries, for only then can the necessary provision for those variables be made in the physician's job-contracts. This is precisely what this paper attempts to highlight.

While there have been many studies on physician incentives in developed countries (see, for instance, Cleverly and Mullen, 1982; Ramsdell, 1985; Egdahl and Taft, 1986; Hemenway, et al., 1990; Hillman, 1987; Hillman, et al., 1989; Pauly, 1980; Relman, 1988; and Welch, 1990), we have not found many that examine the physicians' motivations in developing countries. (For a good critical review of literature in both developed and developing countries, see Bitran and Block, 1992). The general problem of multiple job-holding has also not been studied extensively since the issue was raised by Hamel (1967) and Grossman (1974). Our model is closest in spirit to Shishko and Rostker (1976), although we have drawn valuable insights from the related literature on labor force participation of married women (see, for instance, Zabalza, 1983; Eckstein and Wolpin, 1989; and Heckman and Willis, 1977).

The rest of the chapter is organized as follows: In Section 4.2.1, we discuss the advantages and problems of a salaried system in developing countries. In Section 4.2.2, we present an analytical model explaining the physicians' motivations and analyze one possible form of public-private interaction (i.e., the sharing of labor). We do not at this stage consider the sharing of infrastructure, which is the other form of interaction we highlight in the preceding sections. Section 4.2.3 is devoted to a preliminary discussion on estimation. A preliminary set of policy recommendations is reviewed in Section 4.2.4, and the paper concludes with a short discussion on some conceptual extensions and lays the foundation for future work in this direction.

4.2.1. The Salary System: Merits and Issues

While administrative convenience is definitely one reason why many developing countries adopt a salary system for their hospital physicians, there seem to be at least three other compelling reasons for preferring a salary system, with all its well-known abuses, to other forms of payment.

First, developing countries are typically short of qualified doctors and need some built-in mechanisms in the remuneration structure to ensure that a sufficiently large number of talented persons prefer the medical profession. Whether many or few physicians graduate annually may well depend more upon educational policy than upon any inhibiting effects of the payment system; however, if the payment system does affect initial recruitment into the medical profession, it may well be in the interest of the government to offer prospective physicians the certainty of a salary to any other remuneration structure.

Second, salary systems can be easily adapted to any set of job definitions, while fee-for-service rivets a physician's attention to the diagnostic and therapeutic procedures that can be easily itemized. Usually preventive medicine is not sufficiently rewarded in fee schedules, and the average therapist in countries with fee schedules does little of it. But salaries give large rewards and an adequate position in the medical profession to specialties where work cannot be easily itemized, and can be paid to ordinary doctors for the performance of both therapeutic and preventive procedures. Therefore, most specialists in public health are salaried employees of governments and other organizations.

Third, many developing countries have large populations, and any remuneration system based on number of patients or visits would require a proportionately large outlay of funds for the health sector, which most governments are not in a position to commit. A salary system, in spite all its attendant problems, seems to be the least expensive way of ensuring at least a modicum of services for the entire population.

Perhaps the most serious problem with a salary system is that it lacks the necessary incentives for the physician to put in the required amount of effort. This problem is compounded by the typical inability of the governments of most developing countries to monitor effort, either because of the expenses involved, or because of the administrative structures of most health services. Then, as Glaser (1970) recorded from his visits to many southern European and Middle-Eastern countries, not only is private practice usually more profitable, profits from private practice often have risen faster than public salaries, with the imbalance largest for surgeons, anesthesiologists, and obstetricians. The imbalance can be expected to be the greatest in the poorest countries with the lowest salary scales. As a result, government physicians often come late, leave early, and spend part of their official time in nonmedical activities. Also, physicians are rarely called back to the hospital after official hours; the hospital resident is typically responsible for almost all emergencies. And since the physician is usually supreme in his field, he risks no sanctions; in most countries, in fact, he is more powerful than the hospital director.

Public hospitals in most developing countries are designed for the poor. Large numbers of patients reside in open wards and the out-patient departments are crowded and unattractive. The usual practice, therefore, is that the physician leaves the hospital after his work hours and sees his patients elsewhere in the town. The private patients are treated in his office, and hospitalized in private hospitals and clinics. Conflicts of interest beset the physician when the public and private facilities are distinct. If he treats patients in the public hospital's out-patient department, he may receive nothing beyond his usual salary. But if he treats the patient in his private office, he collects

substantial fees. Seeing the physician privately has several attractions for the patient, too. The physician gives him or her more time and usually does the treatment personally instead of delegating it to junior physicians in the private clinic. While the system works fine for those who can afford to pay, it is much to the detriment of the indigent majority.

It is widely felt, and India is a case in point, that physicians with private practices spot potential paying patients in the out-patient departments of public hospitals and divert them to their private practices with assurances of better care. This tactic threatens the attempt by the public hospitals to attract more upper and middle-class patients and alters their traditional image as repositories of the poor. Also, the diversion hurts the hospital by cutting off income, for many of these facilities have private rooms that can be rented for extra payments.

One alleged problem of public health functionaries being permitted private practices is that of "queue-barging" (Glaser, 1970). A patient with a postponable condition that would place him lower on the waiting list sees a physician privately who orders his early admission. This preferential treatment for private patients leads to undesirable situations where free and timely care become a far cry for most of the poor for whom the free delivery mechanism was designed in the first place.

Many developing countries with salaried health services have serious shortages of doctors and nurses in rural areas. These shortages show up in the form of higher ratios of population to medical staff, and higher vacancy rates in rural than urban areas. For example, in Kenya, the population-to-physician ratio is over 100,000 in some rural areas, compared to 1,500 in the capital city (Kenya Ministry of Health, 1989). Living conditions are usually so backward in the villages and medicine so difficult to practice well that the salary differentials in favor of rural postings have to be much greater to attract doctors. Usually adequate differentials cannot be introduced because a salary structure is based on the rank in the clinical and administrative hierarchy. Since the career structure of urban medicine is ultimately more rewarding than rural medicine, financial reasons reinforce the numerous nonfinancial ones to make rural practice unattractive. As a result, many rural medical posts are not filled while many urban hospitals and polyclinics are overstaffed.

One of the reasons for permitting private practice in developing countries seems to be the general excess demand in the health care market, if the physician-population and hospital-population ratios are taken as indicators of supply of health services (see Exhibit 1). Insofar as the policymakers think of private practice as a social asset rather than merely a tactical concession to the doctors, they assume that the supply of medical services is elastic; in other words, they assume that the prospect of private fees will cause doctors to work harder and heavy consumer demand will be satisfied by an increased volume of medical work beyond salaried hours. Private practice becomes an important safety valve; only by conceding the rights of private practice can the developing countries induce the physician to accept low salaries.

We are aware that the salary system is not the only explanation for poor health care delivery in developing countries. The performance of physicians in public services in these societies is affected by many circumstances that could produce the same results as deficient motivation due to salaried service or low pay. For instance, the hurried and impersonal care given by a salaried

physician in many public hospitals could be due less to the salaried system than to the very large number of patients relative to the supply of physicians. Also, if some physicians are pessimistic about treating a patient, a more important reason than money could be that many patients in developing countries come at late stages of their illness. As another illustration, poor communication between a physician and a patient could well be due to the wide social class differences between a doctor and a public patient. Raising pay might elicit improved performance, but other social and medical reform may be necessary to motivate doctors.

We do not wish to make blanket generalizations about all medical doctors; there are conscientious physicians who, despite low salaries and the temptations of private practice, give maximum attention to their public hospital services. We seek only to stress that the problem in hospital administration is to adopt a system that will standardize obligations and provide appropriate incentives and rewards. Then conscientious performance will become more widespread.

4.2.2. The Model

The starting point of the analysis is the supposition that the physician holds a regular job in a government health facility that calls for a fixed number of hours of work per day at a fixed salary. Let this be referred to as the physician's primary employment. Assume further that the physician can seek alternative employment in the non-primary employment hours, in the sense that she is not legally or contractually prohibited from doing so. The physician then seeks to establish her own private practice, and puts in some hours of work in her own clinic outside the primary employment work hours. Let this be referred to as her secondary employment. In the present analysis, we assume that the secondary employment working hours do not overlap with the working hours of the primary employment, in the sense that even if the physicians do not put in the required level of effort in the primary employment obligations, they do not resort to their private practice during this time. Of course, our model can easily be extended to situations where physicians do in fact spend their primary employment working hours in pursuit of their own private practices.

We note certain characteristics of the primary employment first. Salary in the public facility is usually fixed and is paid for a fixed number of hours the physician is supposed to work in the facility. The problem is not the inability to monitor the number of hours of a physician's input; had this been so, it would be a simple matter of introducing suitable pay-per-hour clauses in the job contract. The problem is the effort input of the physician. It is widely experienced that even though the correct time entries are found in the time-records, there are large periods of the day when suitable effort is not being put by the physician. As we observed earlier, there are problems monitoring this effort, or, rather, the lack of it. Accordingly, salary in the

primary employment is not treated as a function of number of hours worked or number of patients seen; instead, it is taken to be determined ex-ante at the time of appointment of the physician to the government job.

In the secondary market, the physician sees patients for a fee, and we assume that the product of the number of patients and fees charged can be expressed as the product of average hourly wages and the number of hours worked in the secondary employment. Wages in the secondary market are governed not so much by the usual supply-demand conditions as by the reputation of the physician. Reputation in this model evolves according to the characteristics of both primary and the secondary employment, and captures the idea of esteem in which the public holds the physician. It is a function of the level of seniority in the primary employment, a vector embodying distinctions and specializations in the primary employment and the level of patient "satisfaction" in both the primary and secondary markets. Since salary in public hospitals is assumed to increase with seniority and specialization, the ratio of the physician's salary to the highest salary offered to any physician in that public hospital may be taken as an indicator by which the public judges the performance of the physician in the public sector. Wages in the secondary employment are to that extent a function of this salary ratio, denoted by S^* in the primary employment.

We assume that wages in the secondary market are positively related to reputation, which in turn is positively related to public employment. This seems plausible to us for four reasons. First, public employment increases the physician's captive market in the form of self-referrals. Second, it favorably affects the physician's chances of patient contact as more and more potential patients get to know her. Third, it may be important as a signal to avoid the potential negative stigma of not being a public doctor. Fourth, it may be an important positive signal that the doctor will be able to admit her patients as needed.

Consider now a representative physician with a utility function embodying profits Π , leisure L , and a vector of exogenous non-monetary factors, G , examples of which are the physician's age, demographic features of her household, etc. (We assume here that the physician does not get utility from patient benefits.) The physician then seeks to maximize her utility, subject to resource and budget constraints. Since the individual derives her utility not from profits per se but from the consumption goods that this profit allows her to consume, we can substitute a general consumption good, C , for the profit argument in the utility function and write $U=U(C,L,G)$. It is assumed that physicians value extra units of consumption and leisure, and that the utility function is twice-differentiable and concave, i.e., $U_C>0$, $U_L>0$, $U_{CC}<0$, $U_{LL}<0$ and the hessian of second derivatives is negative semi-definite, i.e., $U_{CC}U_{LL}-U_{CL}^2$ is less than or equal to zero.

Total income accruing to the physician is defined as the sum of earnings in the primary and secondary markets.

$$\Pi=S + wN_2$$

where

S = salary in the primary employment

w = wages in the secondary employment

N_2 = number of hours worked in the secondary employment

Since wages in the secondary employment are a function of S^* , number of patients seen in the primary employment, and the level of patient satisfaction, $w=w(S^*,q,z)$
 where q = number of patients seen per hour in the primary employment
 z = level of patient satisfaction

The physician then maximizes $U(C,L;G)$ (1)

subject to the resource constraint

$$24-N_1-N_2-L=0 \quad (2)$$

where N_1 = number of hours worked in the primary employment

where 24 = number of hours in a day

the budget constraint

$$S+ w(S^*,q,z)N_2 -C= 0 \quad (3)$$

and the non-negativity constraints

$$C, L, N_1, N_2 \geq 0 \quad (4)$$

To analyze the physician's labor supply function, we examine the first-order conditions of the maximization problem in (1) to (4) above. The first-order conditions can be written as:

$$U_L - U_C w(S^*,q,z) = 0 \quad (5)$$

$$S+ w(S^*,q,z)N_2 -C = 0 \quad (6)$$

$$24 - N_1 - N_2 - L = 0 \quad (7)$$

From (5) we get

$$U_L/U_C=w(S^*,q,z) \quad (8)$$

which implies that the physician will work in the secondary market until his marginal wage from doing so equals the marginal rate of substitution between income and leisure. This can also be referred to as the shadow wage rate, or the amount required to induce the supplier of labor to offer an additional unit of labor to the market. At higher income levels, the shadow wage rate should be higher, reflecting a greater implicit cost to an extra hour's leisure. Conversely, increased leisure should lower the shadow wage, as the marginal value of leisure time should be less.

The second-order conditions for a maximum require that the hessian, bordered by the first derivatives of the constraints, have a positive determinant. This implies that

$$2w(S^*,q,z)U_{LC} - U_{LL} - \{w(S^*,q,z)\}^2U_{CC} > 0 \quad (9)$$

Totally differentiating the first-order conditions, and rearranging, (10)

$$U_{LL}dL + U_{CL}dC - w(S^*,q,z)U_{CC}dC - w(S^*,q,z)U_{CL}dL = U_C w_s^*dS^* + U_C w_q dq + U_C w_z dz$$

$$-w(S^*,q,z)dN_2 + dC = dS+ N_2 w_s^*dS^*+ N_2 w_q dq +N_2 w_z dz$$

$$- dN_2 - dL = dN_1$$

Manipulating and writing out the equations in matrix form,

$$MB = J \quad (11)$$

where (12)

$$M = \begin{bmatrix} U_{LL} - U_{CL}w(S^*, q, z) & U_{LC} - U_{CC}w(S^*, q, z) & 0 \\ 0 & 1 & -w(S^*, q, z) \\ -1 & 0 & -1 \end{bmatrix}$$

and (13)

$$B = \begin{bmatrix} dL \\ dC \\ dN_2 \end{bmatrix}$$

and (14)

$$J = \begin{bmatrix} U_c w_{s^*} dS^* + U_c w_q dq + U_c w_z dz \\ dS + N_2 w_{s^*} dS^* + N_2 w_q dq + N_2 w_z dz \\ -dN_1 \end{bmatrix}$$

we further note that, given the concavity assumptions (15)

$$|M| = 2w(S^*, q, z)U_{CL} - \{w(S^*, q, z)\}^2 U_{CC} - U_{LL} > 0$$

PROPOSITION 1: The response of physician's labor supply in the secondary market to an increase in salary in the government job is ambiguous.

This follows readily, since (16)

$$\frac{dN_2}{dS} = \frac{-[U_{LC} - w(S^*, q, z)U_{CC}][1 + N_2 w_{s^*}] + U_C w_{s^*}}{|M|}$$

We note that dN_2/dS is positive, zero, or negative as $U_{LC} - w(S^*, q, z)U_{CC}$ is negative, zero, or positive. Since a negative value for dN_2/dS implies that leisure is a normal good, it follows that, for leisure to be a normal good, $U_{LC} - w(S^*, q, z)U_{CC} > 0$. Substituting from (8), the condition translates to

$$U_L U_{CC} / U_C < U_{LC} \quad (17)$$

The derivative of leisure demand is inherently ambiguous in sign. An increase in the wage rate tends to increase labor supply since it makes leisure more expensive: one can get more consumption by working more. But, at the same time, the increase in the wage rate makes one potentially richer, and this presumably increases demand for labor.

It is common experience of many developing countries that physicians work only part of the time for which they are contractually required in the public hospital. Presumably, the physician devotes the balance of N_1 to pursuit of leisure. This would seem to imply that even though the physician attributes a positive value to leisure, an increase in earnings makes leisure much more expensive as compared to the secondary market wage rate than as compared to the public hospital salary. There seems to be some reasonable justification, therefore, of expecting

$$U_{LC} - w(S^*, q, z)U_{CC} < 0 \quad (18)$$

This implies that:

PROPOSITION 2: Increasing the number of patients the physician has to see in the public facility may cause the physician to put in more hours of work in the secondary employment.

Given (17) above, this follows from

$$\frac{dN_2}{dq} = \frac{-[U_{LC} - f(S^*, q, z)U_{CC}][N_2 f_q] + U_C f_q}{|M|} \quad (19)$$

The responsiveness of secondary wages to changes in q can be interpreted as a scale factor affecting the substitution and income effects similarly. This is intuitively appealing, since an increase in q has a positive effect on the fees the physician can charge in her private practice. If the policymakers are not concerned with controlling private practice, then the model suggests that minimum targets of patients to be seen by the physician in the public facility can be set to the advantage of both the physician and the government.

PROPOSITION 3: A sufficiently large fee-per-patient in addition to salary in the primary employment is necessary to induce the physician away from seeking secondary employment.

To examine this, postulate that the physician gets a salary in the primary employment based on the number of public patients seen, i.e.,

$$S^{(q)} = S + bq \tag{20}$$

where b is the fee-per-patient factor. Maximizing the physician's utility function with respect to the revised budget constraint, and taking total differentials of the first-order conditions, we deduce that

$$\frac{dN_2}{dq} = \frac{-[U_{LC} - f(S^*, q, z)U_{CC}][b + N_2 f_q] + U_C f_q}{|M|} \tag{21}$$

A sufficiently large fee-per-patient would have the effect of making pursuit of leisure during N_1 expensive; equation (18) may then be positive.

One of the concerns of any health care delivery system is quality of care. While there are many ways in which quality can be measured, an index of satisfaction of the patient seems to be quite appealing. We have introduced that in this model through the variable z , which also captures the notion of good public relations that the physician has to maintain in order to succeed in his private practice.

PROPOSITION 4: It is in the interest of the physician to ensure satisfaction of her patients in both the markets, since satisfaction has a positive impact on the secondary market wages.

This appealing result follows from

$$\frac{dN_2}{dz} = \frac{-[U_{LC} - f(S^*, q, z)U_{CC}][N_2 f_z] + U_C f_z}{|M|} \tag{22}$$

which, given (18), is positive.

PROPOSITION 5: Increasing working hours in the primary employment may result in the physician reducing the time spent in the secondary employment.

Although this follows from

(23)

$$\frac{dN_2}{dN_1} = U_{LL} - f(S, Q, z)U_{cL}$$

which is likely to be negative, the limitations of this as a policy tool are obvious, since there are limits to which working hours can be increased.

4.2.3. Estimation

The theoretical model can be summarized by assuming that the secondary market wage rate of the i th physician, w_i , is linearly determined by a set of variables X_{wi} , i.e., $w_i = X_{wi}\beta_w + \epsilon_{wi}$ (24)

where ϵ_{wi} is a random deviation with mean zero.

The physician will participate in the secondary market only if $w_i > w^*$, where w^* is the reservation wage rate. One way of estimating the supply curve is to assume that the reservation wage rate, w^* , is also a linear function, i.e.,

$$w^* = X_{ri}\beta_r + \epsilon_{ri} \quad (25)$$

It follows that

$$N_2 = \begin{cases} = 0 & \text{if } w^* > w_i \\ = X_{ni}\beta_n + \epsilon_{ni} & \text{otherwise} \end{cases} \quad (26)$$

If the secondary market wage rate can be observed for all physicians, then the system (24) can be readily solved. One way of ensuring this is to collect the sample from the population of physicians that seeks secondary employment. This would, however, exclude the physicians who do not work in the secondary market. We can easily enrich our analysis by enlarging the sample set to cover physicians who operate in both the markets, as well as those who only work in the public facility. One estimation strategy is to follow Eckstein and Wolpin (1989), assume normality of ϵ_{ni} and ϵ_{wi} , and note that if the estimation of the wage function is based on a sub-sample of physicians working in both markets, such an estimation gives a conditional expectation of w_i .

$$E(w_i \text{ given } N_2 > 0) = E(w_i \text{ given } \epsilon_{ni} > X_{ni}\beta_n) = X_{wi}\beta_w + (\rho_{nw}/\sigma_n)Q_i \quad (27)$$

where Q_i is the ratio of standard normal density function ϕ and distribution function, Φ , i.e.,

$$Q_i = \{\phi(-X_{ni}\beta_n/\sigma_n)\} / \{\Phi(X_{ni}\beta_n/\sigma_n)\} \quad (28)$$

It is assumed that ϵ_{ni} and ϵ_{wi} are normally distributed with variances σ_n^2 and σ_w^2 respectively, and covariance ρ_{nw} .

The secondary market wage function can now be estimated as

$$w_i = X_{wi}\beta_w + (\rho_{nw}/\sigma_n)Q_i + e_{Qi} \quad (29)$$

where e_{Qi} is an error term.

The consistent estimate of Q_i can now be obtained by the probit maximum likelihood estimation of the probability that the physician works in both the markets. To estimate the labor supply function of the entire sample, we follow the Tobit procedure and note that the likelihood function can now be written as

$$L(\beta_n, \sigma_n^2) = [\Pi\{\phi(-X_{ni}\beta_n/\sigma_n)\}] [\Pi\{\Phi(X_{ni}\beta_n/\sigma_n)\}] \quad (30)$$

Maximizing (30) gives the estimated parameter values β_n and σ_n^2 , which explain the supply function.

An alternative estimation strategy is to use Heckman (1980) style sample selection model, and estimate the full structural model as one simultaneous maximum likelihood model. Such estimation procedures are readily available as part of the LIMDEP software, which is available to us both on PCs and on the Boston University mainframe.

4.2.3.1. Statistical Methods

It is proposed to use secondary employment wages to estimate the secondary employment supply function. Since this information would not be available for physicians who only work on their primary employment, it is proposed to use information on the physicians who work in both the markets to estimate a reduced form equation with which the secondary wage rate can be predicted for the entire population of physicians. In the next stage, the data set of independent variables, including the reduced form prediction, will be fitted to the probit maximum likelihood model as discussed in Section 4.2.3.

Many factors can account for variations in observed secondary wages. Variables reflecting personal characteristics such as degree of specialization, family size, and age. Regional intermarket differences, like urban versus nonurban, will be included in the OLS estimate of the secondary wage. In addition, we propose to include the number of patients seen in the primary employment, wages in the primary employment, and an ordinal satisfaction rating of the physicians by the patients. These variables can be thought of as reflecting a number of personal productivity characteristics not captured in the vector of demographic variables. The regression equation will therefore look like:

$$w_i = \beta_0 + \beta_1(\text{age}) + \beta_2(\text{specialization}) + \beta_3(\text{urban}) + \beta_4(\text{primary wages}) + \beta_5(\text{family size}) + \beta_6(\text{number of patients seen in the primary employment}) + \beta_7(\text{rating measure}) + \text{error term}$$

where w_i refers to the secondary wage rate, and binary variables will be used wherever necessary.

To test the hypotheses presented in Section 4.2.2, the following equation will be estimated using the probit maximum likelihood procedure and the secondary wage rate as computed earlier.

$$N_2 = \eta_0 + \eta_1 w_i + \eta_2(\text{primary wages}) + \eta_3(\text{number of hours worked in the primary job}) + \eta_4(\text{interaction term involving secondary and primary wages and primary working hours}) + \eta_5(\text{age}) + \eta_6(\text{specialization}) + \eta_7(\text{family size}) + \eta_8(\text{urban}) + \eta_9(\text{number of patients seen in the primary employment}) + \eta_{10}(\text{rating measure}) + \text{error term}$$

This form allows for direct calculation of the partial derivatives of N_2 with respect to all the variables, and a comparison of these partial derivatives with the theoretical results would provide testable hypotheses of the model.

4.2.4. Policy Recommendations

A number of policy recommendations are suggested.

- ▲ Since the availability of physicians is a serious problem in most developing countries, the governments should not discourage private practice by government physicians. Not only would this ensure an increased availability of physicians, it would provide the necessary incentives for future enrollment in the profession.
- ▲ Target-setting in the public facility is to the advantage of both the government and the physicians, provided private practice is permitted.
- ▲ There appears to be no need for the government to introduce a high fee-per-patient payable to the physician in addition to salaries. This would increase the requirement of funds, and at the same time take away the physician's inducement of maintaining quality in the primary employment, since she would not then be much concerned about her private practice.
- ▲ The appropriate incentive-compatible job-contract which the government can offer the physicians would include the right of private practice. In exchange, the physician would give the primary employer the right to make public announcements about the physician's primary job performance. This is seen as a way of influencing public thinking about the physician's reputation, which, through its effect on the secondary wage rate, has a major impact on the physician's quantity and quality of output.

4.2.5. Some Conceptual Extensions

This model can be readily modified to incorporate dynamic considerations to examine the physician's behavior over her life-cycle. Likewise, non-monetary motives can also be considered: if the physician personally values the opportunities of intellectual research which certain jobs may offer, the effective argument in the utility function can be a vector embodying "consumption" of research opportunities. The model can also be enriched to include the availability of advanced technology in government facilities; one inducement for the physician to put in adequate effort in the government employment could well be the opportunity to use advanced technology, familiarity with which could be a determining factor for reputation. An analysis based on the results of our model will undoubtedly clarify these and related issues.

5.0 PRELIMINARY CONSIDERATIONS FOR FIELD WORK

A primary purpose of this paper was to set up the conceptual foundations for the design and execution of the required field activities to be undertaken in the area of public-private interactions and incentive structures. Clearly, no single study can adequately deal with all pressing issues in any area of public policy, and this study is no exception. We have, accordingly, directed our efforts to answering three questions. First, what are the technical, organizational, socio-political, and institutional factors which are peculiar to private and public sectors involved in delivery and financing of health services? Second, what are the services that the public and private sectors are uniquely qualified to perform? And third, what are the factors affecting a physician's decisions of work hours, and how effective are policy variables like incentive structures in encouraging the desired participation level? We consider each of these issues separately, but propose a common data collection protocol for all of them.

An almost complete lack of reliable data on several key technical, organizational, and institutional aspects of public and private health sectors strongly suggests a new primary data collection effort. Reliance upon a new primary data collection effort warrants a detailed understanding of the survey design, as well as an analysis of its relative strengths and weaknesses. This section is hence devoted to a brief description of our proposed survey approach and a discussion of the choice of host country. Further details would need to be specified if this study is to be pursued to Phases 2 or 3.

5.1 GOALS AND OBJECTIVES OF THE STUDY

This study examines the scope and extent of possible public and private interactions in developing countries. The study objectives are:

- ▲ To improve our understanding of the technical, organizational, and institution factors that are idiosyncratic to the public and private health sectors in developing countries.
- ▲ To improve our understanding of the differences and similarities of the incentive structures in the public and private health sectors.
- ▲ To study the role and impact of incentives to health facility staff on facility efficiency.
- ▲ To identify services where public and private health facilities have comparative advantages or are otherwise uniquely qualified to perform.
- ▲ To recommend policy measures for expanding the role of the private sector in providing and financing delivery of health services.
- ▲ To recommend policy measures regarding nature of employee incentives and contract specification to improve overall efficiency of health care delivery in the public sector.

5.2 DATA SOURCES

Estimation of the model, therefore, requires data on physicians' earnings in the two markets as well as the time allocation between the primary and secondary employment. To analyze the impact of this dual public-private role of the physician, we need to get some idea of the effort which she puts in the two sectors. A reasonably good proxy for that is the number of patients seen by the physician in the two sectors, and the level of patient satisfaction. Designs of incentive-compatible contracts need to be practical and enforceable. Background data of the relevant characteristics of public and private health care systems would therefore be needed. Finally, any innovation in the physician's work regime should be in consonance with the requirements of the patients. This calls for a demand-side study to determine factors influencing the patient's choice of a provider, an estimate of expenditure on health care, types of services being received, and type of services desired.

An almost complete lack of documented data on many of these issues strongly suggests a new primary data collection effort. Reliance upon a new primary data collection effort warrants a detailed understanding of the survey design and instruments, which we now turn to.

5.3 SURVEY DESIGN

In order to address the research questions, the study will focus on public and private facilities, public and private sector physicians including the physicians practicing privately, and patients visiting public and private facilities as well as the private clinics of physicians practicing privately.

By public and private sector facilities, we mean public and private sector hospitals in the conventional sense as hospitals are understood. Facilities here do not mean clinics run by individual doctors, imparting only basic medical treatment. The study will examine the different personnel management styles of public and private health sector facilities and use this information as background material for proposing incentive-compatible contracts.

The study will focus on physicians who are primarily employed in public and private facilities, as well as those who have their own private practices. Primarily employment here is defined as full-time employment in any facility. Private practice is understood as any secondary employment in the private sector for economic gain.

This study, although largely a supply-side study, will examine the patients' decision-making process in the choice of health care provider. For this purpose, the research will focus on patients visiting public and private facilities, as well as the patients who visit the private clinics of physicians who have private practice.

5.4 TYPE OF STUDY DESIGN

The study design will be observational and develop methods for describing and understanding events without any direct intervention. The observational study design proposed will be both cross-sectional and group-comparison. The physician and patient study will be cross-sectional in nature, while the facility study will be group-comparison.

The patient survey will be an “exit survey” in the sense that the patients will be interviewed as soon as they leave the physician’s chamber. For this purpose, the interviewers will be stationed in the waiting hall of the facility, and will keep a record of the time the patient spends in the physician’s chamber. A similar arrangement will be made at the physician’s private clinic.

The physician survey will include a time-motion study besides the questionnaire. The time-motion study will be conducted by having an enumerator in the physician’s chamber, both in the facility as well as in the private clinic, throughout the day. The enumerator will preferably be a medical student; this is a deliberate choice to accomplish three objectives. First, it is expected that the attending physicians would relate better to somebody who has a fair knowledge of medicine than to a non-medical personnel; physician cooperation can be expected to be better. Second, the medical-student-enumerator can be expected to be more familiar with medical procedures than a non-medical enumerator. Third, the physician is not likely to feel intimidated or influenced by the presence of a medical student, and thus behavior-modification (Hawthorn effect) will not be a problem. The medical-student-enumerator will keep an accurate record of what transpires in any physician encounter.

5.5 UNIT OF SAMPLING

It is proposed that the unit of sampling will be the facility and two-stage sampling framework will be used. The study will begin with the development of a strategy for selecting public and private facilities in a host country. The choice of facilities will be governed by the objectives of research, and will include typical public and private health facilities in both urban and rural areas. The sample will include facilities where the health personnel are allowed secondary employment, and where there is evidence of informal sharing of infrastructure between public and private sectors. In the second stage, a sample of physicians will be taken from the facilities selected.

5.6 SAMPLE SIZE

Considerations of sample size are important not only because it is desirable to study a typical sample conceivably incorporating all characteristics of the target population, but also because a meaningful econometric analysis can be carried out only if the sample is “sufficiently large.” On the other hand, time and resource constraints are also binding. Keeping both these factors in mind, we make an attempt to determine a reasonable sample size of the target populations of patients, facilities, and physicians.

Details of several demand-side studies of patients in many developing countries are available in the literature on health issues. Of these, we examine three, and draw necessary conclusions in support of our sample size.

First, Lewis, Solvate, and La Forage (1991) analyze medical staff performance according to the professional levels of physicians and nurses providing care, and the time spent attending to patients and conducting supervisory tasks in the case of a large public hospital in the Dominican Republic. This study surveys all patients entering the emergency service as well as a sample of 1,582 out-patients visiting the hospital during a one-week period. Second, The Egyptian Cost Recovery for Health Project (1992) sponsored by the Egyptian Ministry of Health and USAID, addresses issues of improvements in the quality of services provided, increasing the degree of financing self-sufficiency of hospitals, and ensuring adequate access to care for all. This study relies on a household survey, a patient survey, and a facility survey. For the purpose of this analysis, the sample consisted of 1,652 households and 2,042 out-patients. Third, Ellis, Kirigia, and Mwabu (1990), study demographic patterns and health care utilization for a sample of households in South Nyanza, Kenya. This study focused on a sample of 552 households, comprising 3,063 individuals. Of these, 1,014 persons reported illness during the previous month.

Of these, the Lewis, et al. (1991) study is closest in nature to our proposed analysis. In fact, we propose a similar type of concentrated study of all out-patients visiting the selected public and private facilities over a period of one week.

The issue of selecting a suitable sample of physicians is not as straightforward, largely because fewer studies have been done in this direction. One strategy is to adopt the Lewis, et al. (1991) approach and station enumerators in chambers of all physicians seeing out-patients in the facilities; in fact, given our sample selection of out-patients, this seems to be the logical approach. This, however, does not resolve the issue of sampling physicians who have private practice.

The suggested strategy here is to use the known means and variances of the pertinent characteristics from a previous study, and compute the sample size given the power of the test procedures. If the sample mean is drawn from a normal population, then for a test with 95 percent confidence intervals,

$$\frac{\bar{x}_1 - \mu}{\sigma / (\sqrt{n})} \geq 1.96$$

Ellis, et al. (1991) compute objective indicators for facility quality in Kenya, and their findings indicate a mean facility quality level of 8.79 and a standard deviation of 4.68. If we wish to capture a difference of about 15 percent in the means, then

$$\frac{1.32}{4.68 / (\sqrt{n})} \geq 1.96$$

gives $n = 49$. Similarly, a 10 percent difference in the means gives a sample size of 109, and a 12.5 percent difference calls for a sample size of 70.

Accordingly, we decide on a provisional sample of about 70 physicians.

5.7 SURVEY INSTRUMENTS

It is proposed to rely on questionnaires as survey instruments, and facility and patient questionnaires will be expressly designed for the purposes of this study. To the extent possible, experience from other facility surveys will be incorporated.

The facility questionnaire will consist of four parts. The first part will be designed to collect summary information about the facility, and this information will be verified from the licensing records usually maintained by the district and state government offices. This part of the questionnaire will thus serve as a screening device to ensure facility eligibility for participation in the study.

The second part of the questionnaire will contain questions on facility costs and incomes. The facility will be asked a wide range of questions pertaining to costs, input prices, staffing patterns, assets, liabilities, and output levels. This part of the questionnaire will be designed on the basis of the financial and physical status records which all facilities are in any case required to maintain and periodically submit to the shareholders under the law of the country.

The third part of the questionnaire will focus on management and organizational systems. Detailed questions will be addressed on issues like facility organization, personnel management policies, control systems, financial accounting and budgeting systems, salary structures, stores-purchase management, and inventory control.

The fourth part of the questionnaire will contain the analytical and attitudinal questions in the survey, and will be chiefly addressed to the physicians working in the facility. These questions will seek responses to issues like the characteristics of the facility's practice (income and urban mix of the patient population, for example), physician's work effort (number of hours and visits spent in a wide range of activities (e.g., office visits, hospital rounds, out-patient department duties, and surgeries), organization of the facility's practice style (e.g., locus of decision making and control, methods used for income-sharing), and physician's attitudes (e.g., preferences for different practice modes, political attitudes).

The patient questionnaire will elicit information on the demographic characteristics of the patient and will focus on issues like demand for health care, choice of provider, and general satisfaction level with the services provided.

5.8 CHOICE OF HOST COUNTRIES

In this section we examine factors influencing the choice of country or countries where the proposed study can potentially be carried out, given our goals and objectives, sample design, and survey instruments. To qualify for this study, a host country from amongst the developing countries would satisfy the following requirements:

- ▲ The host country would have a sizeable public provision and financing of health care services. Additionally, the public health services would be available in both urban and rural areas, and the emphasis of public health services would be on both preventive and curative health care delivery.
- ▲ The host country would have a large private sector participation in health care delivery.
- ▲ Both public and private health care services would be of a comparable nature, in the sense that neither would be much superior to the other.
- ▲ Private practice would be permitted, or there would be evidence of moonlighting by public health personnel.
- ▲ The host country would have a large number of physicians in both public and private sectors.
- ▲ There would be no logistic constraints, in the sense that there would be no problems of access to data and availability of data-collecting personnel. Additionally, governmental support would be desirable.
- ▲ If the study is confined to only one country, that country would exhibit characteristics typical of most developing countries.

We accordingly assembled data on medical facilities for some of the poorest countries of the world (Exhibit 3). It is observed that India has the largest number of physicians and nurses, which is not surprising given its population; at the same time, India also has a comparatively low population per physician. Egypt, with only 770 persons per physician (World Development Report, 1991, The World Bank) has been remarkably successful in ensuring availability of doctors. The ratio of population per physician is low for Pakistan also, although the number of nurses is also very low, indicating an imbalance towards physicians. On government expenditure, we note that Kenya has highest government spending on health among the developing countries under review, followed by Bangladesh. Again, India has the largest number of hospitals and hospital beds, with a comparatively low population per bed. This would roughly indicate the general availability of health care to a majority of the population. In light of these indicators, we select Egypt, India, Kenya, and Pakistan as likely host countries for carrying out this study on public-private interactions, and examine some more basic indicators in an attempt to narrow the list further.

Exhibit 4 looks at per capita income levels, urban population, and some basic health indicators of these four countries. Clearly, Egypt with a per-capita income almost double the average for all low income countries, would not be classified as a typical poor country, although there would be many lessons to be learned from the Egyptian experience of development. The available information indicates that India has been quite successful in ensuring access of health services, if percentage of births attended by health staff is any indicator. Kenya, with high fertility and low infant mortality rates, seems poised for rapid population increases, which will undoubtedly place a heavy demand on health services in the near future.

We find that if the study is to approximate the general reality of all developing countries, it should be carried out in all of these countries, since they differ much in basic characteristics. At the same time, we note distinct advantages in conducting this study only in India, for if local variations in any one country approximate the developing world-scenario, it is India. Exhibits 5 and 6 give some indication of this variation, both within the country as well as in comparison with other countries of the developing world.

For this draft of the report, we have not had time to contact all of the necessary individuals or explore the suitability of most countries other than India. Because we feel strongly that it is highly advantageous to include India among the host countries, we have incorporated an extended discussion of India here. For the final draft of this report, we anticipate including further discussion of other host countries from HFS researchers.

5.9 RATIONALE FOR INCLUSION OF INDIA

The health services of India affect the lives of some 880 million people in one of the world's poorest countries. This alone would make it a worthy subject of study. Health services are in general provided by state governments under the supervision of the federal Ministry of Health. At the smallest peripheral level, a network of primary health centers is being developed to serve populations of about 20,000. These centers, staffed by a medical officer and various types of paramedics, also serve the subcenters. Villages with small populations (1,000) are served by

voluntary health guides, trained by the government. In cities and large urban areas, the delivery of health care is undertaken also by municipal bodies, which have also developed a network of primary health care centers for the low-income populations. The private sector supplements the delivery system, and has contributed significantly to the development of secondary and tertiary hospitals in the past two decades.

The government health services are by and large available for free. Health services by the private sector are, in comparison, very expensive. There appears to be no uniformity regarding the quality of health services, in that both good and poor quality services are as likely to be available in the government facilities as in the private sector. Almost all the government health personnel are permitted private practice. This system is considered to be one of the major problems in health care delivery in India, insofar as adequate attention does not seem to be given to patients in the government hospitals.

Government expenditure on health services has been increasing throughout the last few decades, and increasingly larger sums are being spent on preventive measures. If potable drinking water supply and sanitation schemes are included, then almost half the total allocation of funds for the health sector is earmarked for preventive measures (Exhibits 3 and 7).

Any discussion of India's cultural geography stresses its pluralism, and health care in India is as diverse as the subcontinent on which it is practiced. This diversity is ideologically, politically, and socio-culturally appropriate in that multiple systems of health care continue to function and thrive even though there are major differences in the medical orientations and philosophies of each.

This pluralism applies to economic descriptions as well. Within the country itself, there are pronounced differences in the well-being of its people. There are states (like Punjab, Gujerat, Maharashtra) which boast of a per-capita income equal to most of the industrialized countries, while there are others (like Bihar, Madhya Pradesh, Orissa) which continue to be underdeveloped and poor. These differences extend to socio-cultural traits as well as to the general lifestyle and outlook. In this sense, the country can be divided into four distinct socio-economic zones: the industrialized West, with a strong private sector; the organized South, with a profit-making public sector; the less-developed East, with almost no private sector activity; and the agriculturally prosperous North.

As we noted earlier, this is advantageous from the point of view of this study, for we find vastly different economic and organizational characteristics within the boundaries of one country. By suitably selecting the areas for study, it would be possible to capture various socio-economic levels which would, in turn, conform to the prevailing situation in the majority of the developing countries of the world. Exhibit 6 gives an indication of health expenditures and health status of different states in India.

Detractors of conducting any study in India often argue that health policy in India is so closely dominated by national and international class interests that little scope remains for major change. It is also argued that access to government data in India tends to be difficult, either because

of bureaucratic red-tape, or the general diffidence of the Indian political thinking to allow any potentially discrediting study to take place. This is, however, only part of the story.

In the first place, it ignores the very real achievements of Indian health policy. Health planners have ensured that resources are allocated to preventive medicine, rural areas, and paramedical workers. Substantial preventive campaigns have been waged against malaria and smallpox. Large numbers of primary health care centers and subcenters have been built and equipped, and staff have been appointed. Beneficiaries may have been disproportionately drawn from the higher classes and castes, but the poor have not been totally excluded. The numbers of paramedical staff have continued to rise, and those now in place could potentially supply most of the population with reasonably good health care. Some of the services have probably supported the declines in mortality, halting and uncertain although these may have been.

One reason for these achievements may have been that the various buttresses of class and caste domination are fortunately not the most crucial. To be sure, radical health-sector proposals are energetically opposed by those whose interests are directly affected. Equally, the redistribution of local resources, which might potentially overcome health inequalities or significantly reduce the diseases of poverty, will also be resisted. But very few health proposals come at all close to such radical ideas. The more notable features of Indian health policy are the shifts towards "appropriate" models. Factors internal to the government and political party structure have limited implementation of even these relatively modest proposals, but still they have been introduced.

Further, the Indian achievements appear considerable when measured against those of other developing countries. Take, for instance, its neighbor, Pakistan, which shares India's historical legacy. Per-capita levels in Pakistan are comparable to those in India, and resource constraints have been much at the same level. As in India, allocations to health services in the plans have been underspent, but in Pakistan the health sector has spent a smaller proportion of its allocation than the other social services (Zaidi, 1988).

In the third plan (1965-70), for instance, only 59 percent of the health allocation was spent, without taking into account inflation. Hospitals and medical education have generally spent more than they were allocated, although this pattern was disrupted when malaria control programs went wrong more drastically in Pakistan than in India. Rural health programs have been allocated relatively little, and have spent even less. Differentials in the availability of health services are much higher in Pakistan than in India, and the imbalance towards doctors is much greater. In 1987, there were more physicians (51,020) than all other health personnel combined.

The advantages of having a senior government officer involved in a study of his own country cannot be overemphasized. We feel, therefore, that access to data and other logistic issues pose no problems since one of the investigators, Mukesh Chawla, is a senior member of the Indian civil service. Besides his official status which would be a great help in conducting the research, Mukesh

is widely travelled in India and familiar not only with the place, its socio-politico-economic systems, culture, and languages, but also with the government, bureaucracy, and administrative systems.

5.10 HIRING AND TRAINING OF ENUMERATORS

It is proposed to have a team of enumerators at each of the major cluster of facilities. The team of enumerators will be headed by a supervisor, and one supervisor will be stationed at each cluster location. Suitable training will be imparted to the enumerators, and the survey instruments will be translated wherever necessary.

5.11 PILOT SURVEY

A pilot survey of a few facilities will be conducted to test willingness of facilities and physicians to participate as well as to test the questionnaire and the skills of the enumeration staff. Necessary revisions will then be made on the questions to improve the accuracy of the responses. Due to a concern over the possible bias in the reporting of physician work hours, alternative validation procedures will be developed.

5.12 FIELD METHODS

It is proposed to make the initial contact with the facility by letter, explaining the purpose and scope of the study and guaranteeing confidentiality. The cooperation of the facilities will be sought and appointments will be set up with the willing facilities. It is anticipated that a few facilities will refuse participation, even after conveying their willingness. An appropriate cushion will therefore be kept in the number of units selected in the second stage. In any case, those facilities which back out will not be contacted again for the purpose of this study, as their revised decision may manifest itself in inaccurate responses.

5.13 DATA PROCESSING

The facility and physician data so collected will then be converted into files suitable for analysis through standard statistical packages. It is proposed to do the analysis of data in the U.S. A report summarizing the methods, findings, and policy recommendations will also be prepared in the U.S.

EXHIBIT 3
MEDICAL FACILITIES IN SELECTED COUNTRIES, 1987

	Bangladesh	Egypt	India	Indonesia	Kenya	Malaysia	Nepal	Pakistan
Population (million, 1989)	110	53	812	177	24	17	18	108
Number of Physicians	16929	68935	325400	23084	2475	5794	863	51020
Number of Nurses	12587	26147	618800	64087	12886	33545	1845	27311
Number of Hospitals	875	...	37600	1436	316	254	91	4180
Number of Beds	33038	...	719000	112328	12962	37376	3842	60093
Population per Physician	6219	770	2400	7372	10050	2853	20376	1973
Population per Nurse	8739	2027	1312	2761	1862	506	9756	3954
Population per Bed	3187	...	1086	1515	1852	442	4577	1678
Physician-Nurse Ratio	1.34	2.64	0.53	0.36	0.19	0.17	0.47	1.87
Government Expenditure on Health (% of total)	4.97 (1985)	2.47	1.87	1.47	6.00	...	4.42	0.88 (1986)

Sources:

- 1) Statistical yearbook for Asia and the Pacific, 1990, ESCAP, United Nations.
- 2) IMF Government Finance Statistics Yearbook, 1990 (for health expenditure data only).
- 3) Ellis, R.P (1987): "The Revenue-Generating Potential of User Fees in Kenyan Government Health Facilities," for data on number of hospitals and hospital beds in Kenya. This data pertains to 1982.

**EXHIBIT 4
SELECTED INDICATORS**

	Egypt	India	Kenya	Pakistan	All low-income countries
Area (000 sq.km)	1001	3288	580	796	...
GNP per capita (\$)	640	340	360	370	330
Average annual growth rate of GNP per capita (% , 1965-89)	4.2	1.8	2.0	2.5	2.9
Life expectancy at birth	60	59	59	55	62
Births attended by health staff (% , 1985)	24	39	...	24	...
Infant mortality*	80.5	95.4	68.7	105.5	...
Total fertility rate**	4.5	4.1	6.8	6.5	...
Urban population	48.3	27.5	23.0	31.6	...
Daily calorie supply per capita	3213	2104	1973	2200	2090

* Per 1000 live births.

** Total fertility rate represents number of children that would be born to a woman if she were to live to the end of her child-bearing years.

Source: World Development Report, 1991, The World Bank.

EXHIBIT 5
HEALTH EXPENDITURE AND INDICATORS IN INDIA BY STATES

	Per Capita Expenditure (rupees, 1980-81 prices)	Per Capita Expenditure (rupees, 1980-81 prices)	Rate of Growth of Government Expenditure	Life Expectancy	Infant Mortality
	1976-77	1986-87	1976-86	1986	1986
Andhra Pradesh	18.1	30.4	5.3	53.1	83
Bihar	8.7	15.0	5.6	46.0	105
Gujerat	20.2	39.6	7.0	52.4	98
Haryana	20.4	37.5	6.3	54.8	85
Karnataka	20.0	23.2	1.5	56.3	71
Kerela	24.8	29.3	1.7	65.5	32
Madhya Pradesh	17.6	18.3	0.4	49.0	122
Maharashtra	20.3	44.7	8.2	56.3	68
Orissa	15.7	32.2	7.4	49.1	130
Punjab	24.1	32.8	3.1	60.5	71
Rajasthan	21.4	32.8	4.4	51.9	108
Uttar Pradesh	10.0	19.1	6.7	46.2	140
West Bengal	22.0	25.4	1.4	52.0	77

Source:

Kakwani, Nanak, and Kalinidhi Subbarao (1990): "Rural Poverty in India, 1973-86," The World Bank.

EXHIBIT 6
SELECTED INDIAN STATES AND DEVELOPING COUNTRIES: SOME COMPARISONS

	Life Expectancy	Infant Mortality
Bihar, (India), 1986	46	105
Angola, 1989	46	132
Niger, 1989	45	130
West Bengal, (India), 1986	52	77
Bangladesh, 1989	51	106
Zaire, 1989	53	94
Cote d'Ivoire, 1989	53	92
Maharashtra, (India), 1986	56	68
Pakistan, 1989	55	106
Ghana, 1989	56	86
Kerala, (India), 1986	66	32
Philippines, 1989	64	42
Ecuador, 1989	66	61
Thailand, 1989	66	28

Sources:

Kakwani, Nanak, and Kalinidhi Subbarao (1990): "Rural Poverty in India, 1973-86," The World Bank.
 World Development Report, 1991, The World Bank.

**EXHIBIT 7
PLANNED OUTLAYS IN THE HEALTH SECTOR IN INDIA**

	1951-56	1956-61	1961-66	1969-74	1974-79	1979-84	1984-89
	%	%	%	%	%	%	%
Control of Communicable Diseases	16.5	28.4	20.6	11.0	6.2	7.5	6.9
Medical Education, Research, and Training	15.4	16.0	8.5	8.5	4.1	8.3	7.3
Hospitals and Dispensaries	32.6	24.3	24.1	18.1	18.8	10.3	8.6
Family Planning	0.5	1.3	7.9	27.3	18.8	14.4	21.8
Nutrition	0.0	0.0	0.0	0.0	14.8	3.4	11.7
Water Supply and Sanitation	35.0	33.8	30.8	35.2	37.3	56.1	43.7
Total Health-Related Expenditure (rupees millions)	1,400	2,250	3,415	11,555	27,376	69,910	149,180

Source:

Plan Documents, Government of India

REFERENCES

- Adreano, Ralph and Thomas Helminiak (1987). "The Role of the Private Sector in Health Care in the Developing Countries." World Bank EDI-ADB Seminar on Health Care Financing. Manila, Philippines.
- Agency for International Development (1986). "Implementing A.I.D. Privatization Objectives." Policy Determination 14.
- Ainsworth, Martha and Jacques van der Gaag (1988). "Guidelines for Adapting the LSMS Living Standards Questionnaires to Local Conditions." LSMS Working Paper Number 34. The World Bank, Washington, D.C.
- Akin, John S., et al. (1987). "Financing Health Services in Developing Countries: An Agenda for Reform." A World Bank Policy Study, Washington, D.C.
- Altman, Stuart H. and Sanford L. Weiner (1978). "Regulation as a Second Best." in Warren Greenberg (ed), "Competition in the Health Care Sector". Aspen Systems Corporation, Maryland.
- Altman, Stuart H. and Marc Rodwin (1988). "Halfway Competitive Markets and Ineffective Regulation: The American Health Care System." Journal of Health Politics, Policy and Law, Vol. 13, Number 2.
- Ambrose, William W., Paul R. Hennemeyer and Jean-Paul Chapon (1990). "Privatizing Telecommunications Systems: Business Opportunities in Developing Countries." IFC Discussion Paper Number 10, Washington, D.C.
- Arrow, K.J. (1963). "Uncertainty and the Welfare Economics of Medical Care." American Economic Review, Vol. 53, 941-69.
- Bailey, E.E (1986). "Price and Productivity Change Following Deregulation: The US Experience." Economic Journal, Vol. 96 page 1-17.
- Barnum, H.N. and J.P. Kutzin (1990). "Public Hospitals in Developing Countries: Resource Use, Costs, Financing". John Hopkins University Press, Baltimore.
- Baron, D. and D. Besanko (1984). "Regulation and Information in a Continuing Relationship." Information Economics and Policy, Vol. 1.
- Baron, D. and D. Besanko (1987). "Commitment and Fairness in a Dynamic Regulatory Relationship." Review of Economic Studies, Vol. 54.
- Baumgardner, James R. (1988). "Physicians' Services and the Division of Labor Across Local Markets." Journal of Political Economy, Vol. 96, Number 5.

- Benham, Lee (1978). "Guilds and the Form of Competition in the Health Care Sector" in Warren Greenberg (ed), "Competition in the Health Care Sector." Aspen Systems Corporation, Maryland.
- Bitran, R. and S. Block (1992). "Provider Incentives and Productive Efficiency in Government Health Services, Phase 1 Report." (Draft), Abt Associates Inc., Massachusetts.
- Bokhari, Riyaz (1989). "Privatization in Pakistan" in V.V. Ramanadham (ed): "Privatization in Developing Countries." Routledge, London, 1989.
- Bovbjerg, Randall R., Philip J. Held, and Mark V. Pauly (1987). "Privatization and Bidding in the Health-Care Sector." *Journal of Policy Analysis and Management*, Vol. 6, Number 4, pp. 648-665.
- Call, G. and T. Keeler (1985). "Airline Deregulation, Fares, and Market Behavior: Some Empirical Evidence" in A. Daugherty (ed): "Analytical Studies in Transport Economics." Cambridge: Cambridge University Press, 1985.
- Candoy-Sekse, Rebecca and Anne Ruiz Palmer (1988). "Techniques of Privatization of State-Owned Enterprises: Inventory of Country Experience and Reference Materials." Technical Paper Number 90. The World Bank, Washington, D.C.
- Caves, D.W. and Laurits R. Christensen (1980). "The Relative Efficiency of Public and Private Firms in a Competitive Environment: The Case of Canadian Railroads." *Journal of Political Economy*, Vol. 88, Number 51, pp. 958-975.
- Caves, G.D. and T.E. Keeler (1985). "Airline Deregulation, Fares, and Market Behavior: Some Empirical Evidence" in A.F. Daugherty (ed), "Analytical Studies in Transportation Economics."
- Chamberlin, John R. and John E. Jackson (1987). "Privatization as Institutional Choice." *Journal of Policy Analysis and Management*, Vol. 6, Number 4, pp. 586-603.
- Claquin, Pierre (1981). "Private Health Care Providers in Rural Bangladesh." *Social Science and Medicine*, Vol. 15, Number 3, pp. 153-57.
- Cleverly, William and Robert Mullen (1982). "Management Incentive Systems and Economic Performance in Health Care Organizations." *Health Care Management Review*.
- Coleman, J.S., T. Hoffer and S. Kilgore (1982). "High School Achievement: Public, Catholic, and Private Schools Compared." NY Basic Books, 1982.
- Cross, Harry (1991). "Public-Private Collaboration." HFS Theme Paper, Year Two, 1991.

- Cross, Harry and Ruth Levine (1990). "Public-Private Collaboration." HFS Theme Paper, Year One, 1990.
- Davies, D.G (1971). "The Efficiency of Public Versus Private Firms: The Case of Australia's Two Airlines." *Journal of Law and Economics*, 14, pp. 149-65.
- de Ferranti, David (1985). "Paying for Health Services in Developing Countries." World Bank Staff Working Paper Number 721, Washington, D.C.
- Dunlop, D.W. and Taryn Vian (1992). "Pharmaceutical Financing in Africa: Issues, Macroeconomic Context and Micro-analysis of Pharmaceutical Cost Recovery Schemes." Prepared for the African Health Care Financing Project under the management of Martha Ainsworth, AFTPN, The World Bank.
- Eckstein, Z. and K.I. Wolpin (1989). "Dynamic Labor-Force Participation of Married Women and Endogenous Work-Experience." *Review of Economic Studies*, Vol. 56, pp. 375-390.
- "Economic Survey of Nepal, 1986-87", Government of Nepal, Kathmandu.
- Edozein, John D. and S.O. Adeoye (1989). "Privatization in Nigeria" in V.V. Ramanadham (ed): "Privatization in Developing Countries." Routledge, London, 1989.
- Egdahl, Richard and Cynthia Taft (1986). "Financial Incentives to Physicians." *New England Journal of Medicine*, Vol. 315, Number 1, pp. 59-61.
- Ellis, R.P. and Germano Mwabu (1992). "The Demand For Out-Patient Medical Care in Rural Kenya." Working Paper.
- Faulhaber, Gerald (1987). Comment on Richard Nelson's "Role of Government in a Mixed Economy." *Journal of Policy and Management*, Vol. 6, Number 4.
- Fershtman, Chaim and Kenneth L. Judd (1987). "Equilibrium Incentives in Oligopoly." *American Economic Review*, Vol. 77.
- Glaser, William A. (1970). "Paying the Doctor." The John Hopkins Press, London.
- Griffin, Charles (1989). "Strengthening Health Services in Developing Countries Through the Private Sector." IFC Discussion Paper Number 4, The World Bank, Washington, D.C.
- Grossman, A., (1974). "Multiple Job-Holdings in May 1974." Special Labor Report No. 177, US Department of Labor.

- Grossman, Sanford J. and Oliver Hart (1983). "An Analysis of the Principal-Agent Problem." *Econometrica*, Vol. 51, Number 1.
- Groves, Theodore and John O. Ledyard (1987). "Incentive Compatability Since 1972." in Groves, Radner and Reiter (ed), "Information, Incentives, and Economic Mechanisms." University of Minnesota Press, Minneapolis.
- Gunderson, M. (1979). "Earning Differentials Between Public and Private Sectors." *Canadian Journal of Economics*, 12, pp. 228-42.
- Hamel, H.R. (1967). "Moonlighting: An Economic Phenomena." *Monthly Labor Review*, Vol. 90, pp. 17-22.
- Hanushek, E.A. (1990). "Alternative Assessments of the Performance of Schools." *Journal of Human Resources*, 1990, p. 179.
- Haque, Irfan ul (1991). "International Competitiveness: Interaction of the Public and Private Sectors." EDI Seminar Series, The World Bank, Washington, D.C.
- Harris, Jeffrey (1977). "The Internal Organization of Hospitals: Some Economic Implications." *The Bell Journal of Economics*, Vol. 8, Number 2.
- Harris, M. and A. Raviv (1979). "Optimal Incentive Contracts with Imperfect Information." *Journal of Economic Theory*, Vol. 20.
- Harrison, D. H. and J. R. Kimberley (1982). "Private and Public Initiatives in Health Maintenance Organizations." *Journal of Health Politics, Policy and Law*, Vol. 7, pp. 80-95.
- Hart, Oliver D. (1983). "Optimal Labor Contracts Under Asymmetric Information: An Introduction." *Review of Economic Studies*, L, pp. 3-35.
- Hatch, John (1987). "Privatization and the Consumer." Seminar on Privatization, Templeton College, Oxford, Sept.-Dec. 1987.
- Havighurst, Clark C. (1978). "Role of Competition in Cost Containment" in Warren Greenberg (ed), "Competition in the Health Care Sector." Aspen Systems Corporation, Maryland.
- Heald, David and David Steel (1986). "Privatizing Public Enterprise: An Analysis of the Government's Case" in John Kay, Colin Mayer, and David Thompson (eds): "Privatization and Regulation - The U.K. Evidence." Oxford.
- Heaver, Richard (1989). "Improving Family Planning, Health and Nutrition in India: Experience From Some World Bank-Assisted Programs." *World Bank Discussion Paper*, Number 59, Washington, D.C.

- Heckman, J.J. and R.J. Willis (1977). "A Beta-Logistic Model for the Analysis of Sequential Labor Force Participation of Married Women." *Journal of Political Economy*, Vol. 85, pp. 27-58.
- Heckman, J.J. (1980). "Sample Selection Bias as a Specification Error with Application to the Estimation of Labor Supply Functions" in J.P. Smith, ed. "Female Labor Supply: Theory and Estimation." Princeton, NJ.
- Hegstad, Sven Olaf and Ian Newport (1987). "Management Contracts: Main Features and Design Issues." World Bank Technical Paper, Number 65, Washington, D.C.
- Hemenway, David, Alice Killen, Suzanne B. Cashman, Cindy Lou Parks, and William J. Bicknell (1990). "Physicians' Responses to Financial Incentives: Evidence from a For-Profit Ambulatory Care Center." *New England Journal of Medicine*, Vol. 322, Number 15, pp. 1059-63.
- Hillman, Alan L. (1987). "Financial Incentives for Physicians in HMOs: Is There a Conflict of Interest?" *New England Journal of Medicine*, Vol. 317, Number 27, pp. 1743-48.
- Hillman, Alan L., Mark V. Pauly, and Joseph J. Kerstein (1989). "How Do Financial Incentives Affect Physicians' Clinical Decisions and the Financial Performance of Health Maintenance Organizations?" *New England Journal of Medicine*, Vol. 321, Number 2, pp. 86-92.
- Holmstrom, B. (1977). "On Incentives and Control in Organizations." unpublished doctoral dissertation, Stanford University.
- Holmstrom, Bengt and Joan Ricart I Costa (1986). "Managerial Incentives and Capital Management." *Quarterly Journal of Economics*, November.
- Holmstrom, Bengt and Jean Tirole (1987). "The Theory of the Firm" in Schmalansee and Willig (ed), "Handbook of Industrial Organizations." North Holland, Amsterdam.
- Jayawardene, A.S. (1989). "Privatization in Sri Lanka" in V.V. Ramanadham (ed), "Privatization in Developing Countries." Routledge, London, 1989.
- Jesani, A. and S. Anantharam (1989). "Private Sector and Privatization in the Health Care Services." Foundation for Research in Community Health, Bombay, India.
- Jimenez, Emmanuel (1987). "Pricing Policy in the Social Sectors: Cost Recovery for Education and Health in Developing Countries." John Hopkins University Press.
- Jimenez, Emmanuel and Donald Cox (1989). "Relative Effectiveness of Private and Public Schools: Evidence From Two Developing Countries." LSMS Working Paper, Number 60, The World Bank, Washington, D.C.

- Jimenez, Emmanuel, Marlaine E. Lockheed, and Vicente Paqueo (1991). "The Relative Efficiency of Private and Public Schools in Developing Countries." *The World Bank Research Observer*, Vol. 6, Number 2, pp. 205-18.
- Jones, Leroy P. (1991). "Performance Evaluation for Public Enterprises." Discussion Paper Number 122, I.F.C./World Bank, Washington, D.C.
- Kapur, Deepika (1990). "A Study of the Effects of Test Anxiety, Belief in Control of Reinforcement and Intelligence on Intellectual Achievement of Two School Populations." Unpublished doctoral thesis, Panjab University, Chandigarh, India.
- Karanja, R.V. (1989). "Privatization in Kenya" in V.V. Ramanadham (ed) "Privatization in Developing Countries." Routledge, London, 1989.
- Khalaf, Rima (1989). "Privatization in Jordan" in V.V. Ramanadham (ed) "Privatization in Developing Countries." Routledge, London, 1989.
- Kotlikoff, Laurence J. (1987). "Justifying Public Provision of Social Security." *Journal of Policy Analysis and Management*, Vol. 6, Number 4, pp. 674-688.
- Laffont, Jean-Jacques and Jean Tirole (1986). "Using Cost Observations to Regulate Firms." *Journal of Political Economy*, 94, pp. 614-41.
- Laffont, Jean-Jacques and Jean Tirole (1987). "Comparative Statics of the Optimal Dynamic Incentives Contract." *European Economic Review*, 31, pp. 901-926.
- Laffont, Jean-Jacques and Jean Tirole (1988). "The Dynamics of Incentive Contracts." *Econometrica*, Vol. 56, Number 5.
- Laffont, Jean-Jacques and Jean Tirole (1988). "Using Cost Observation to Regulate Firms." *Journal of Political Economy*, Vol. 94, Number 3.
- Leadbeater, Charles (1987). "The Policies of Prosperity." Fabian Society, No. 523, London.
- Lee, Barbara and John Nellis (1990). "Enterprise Reform and Privatization in Socialist Economies." World Bank Discussion Paper, Number 104, Washington, D.C.
- Lee, Kyu Sik and Alex Anas (1989). "Manufacturers' Responses to Infrastructure Deficiencies in Nigeria: Private Alternatives and Policy Options." World Bank Policy, Planning and Research Working Paper.
- Levin, Henry M. (1987). "Education as a Public and Private Good." *Journal of Policy Analysis and Management*, Vol. 6, Number 4, pp. 628-640.

- Lewis, Maureen A. (1988). "The Private Sector and Health Care Delivery in Developing Countries: Definition, Experience, and Potential." John Snow, Inc., U.S.A.
- Lewis, M., M. Solvetta and G. LaForgia (1992). "Productivity and Quality of Public Hospital Medical Staff: A Dominican Case Study." *International Journal of Health Planning and Management* (forthcoming).
- Marsan, V.A. (1986). "Istituto per la Ricostruzione Industriale" in V.V. Ramanadham (ed) "Public Enterprise: Studies in Organizational Structure." Frank Cass, London.
- Marsden, Keith and Therese Belot (1987). "Private Enterprise in Africa: Creating a Better Environment." World Bank Discussion Paper Number 17, Washington, D.C.
- Marsden, Keith (1990). "African Entrepreneurs: Pioneers of Development." IFC Discussion Paper Number 9, Washington, D.C.
- Maynard, Alan (1982). "The Regulation of Public and Private Health Care Markets" in Maynard, Alan and Gordon Mclachlan (ed), "The Public-Private Mix for Health." The Nuffield Provincial Hospital Trust, London.
- McCarthy, F.D. (1990). "Problems of Developing Countries in the 1990s." World Bank Discussion Papers, Numbers 97 and 98, Washington, D.C.
- Mclachlan, Gordon and Alan Maynard (1982). "The Public-Private Mix in Health Care: The Emerging Lessons." in Maynard, Alan and Gordon Mclachlan (ed), "The Public-Private Mix for Health." The Nuffield Provincial Hospital Trust, London.
- Millward, R. (1982). "The Comparative Performance of Public and Private Enterprise." in Lord Roll (ed) "The Mixed Economy." Macmillan, London.
- Musgrove, P. (1986). "What Should Consumers in Poor Countries Pay for Publicly Provided Health Services." *Social Science and Medicine*, Vol. 22, pp. 329-33.
- Nankani, Helen (1988). "Techniques of Privatization of State-Owned Enterprises: Selected Country Case Studies." Technical Paper Number 89, The World Bank, Washington, D.C.
- Nellis, John (1989). "Contract Plans and Public Enterprise Performance." World Bank Discussion Paper Number 48, Washington, D.C.
- Nelson, Richard R. (1987). "Roles of Government in a Mixed Economy." *Journal of Policy Analysis and Management*, Vol. 6, Number 4, pp. 541-546.
- Over, Mead (1991). "Economics for Health Sector Analysis: Concepts and Cases." EDI Technical Materials, The World Bank, Washington, D.C.

- Pack, Janet R. (1987). "Privatization of Public Sector Services in Theory and Practice." *Journal of Policy Analysis and Management*, Vol. 6, Number 4, pp. 523-540.
- Paul, Samuel (1990). "Assessment of the Private Sector: A Case Study and its Methodological Implications." *World Bank Discussion Paper Number 93*, Washington, D.C.
- Pauly, Mark V. (1970). "Efficiency, Incentives, and Reimbursement for Health Care." *Inquiry*, Vol. VII, Number 1, pp. 114-31.
- Pauly, Mark V. (1980). "Doctors and Their Workshop: Economic Models of Physician Behavior." *University of Chicago Press*, Chicago.
- Pfeffermann, Guy P. (1988). "Private Business in Developing Countries: Improved Prospects." *IFC Discussion Paper Number 1*, Washington, D.C.
- Pfeffermann, Guy P. (1991). "Trends in Private Investment in Developing Countries, 1990-91 Edition." *IFC Discussion Paper Number 11*, The World Bank, Washington, D.C.
- Pier, W.J., R.B. Vernon, and J.H. Wicks (1974). "An Empirical Comparison of Government and Private Production Efficiency." *National Tax Journal*, 27, pp. 653-56.
- Poole, Jr., Robert W. and Philip E. Fixler Jr. (1987). "Privatization of Public-Sector Services in Practice: Experience and Potential." *Journal of Policy Analysis and Management*, Vol. 6, Number 4, pp. 612-624.
- Poullier, Jean-Pierre (1986). "The Public-Private Mix and International Health Care Costs" in Culyer and Johnson (ed) "Public and Private Health Services, Complementarities and Conflicts." *Oxford, U.K.*
- Radner, Roy (1987). "Decentralization and Incentives" in Groves, Radner and Reiter (ed), "Information, Incentives, and Economic Mechanisms." *University of Minnesota Press*, Minneapolis.
- Ramamurty, Ravi and Raymond Vernon (1991). "Privatization and Control of State-Owned Enterprise." *EDI Development Studies*, The World Bank, Washington, D.C.
- Ramanadham, V.V. (1984). "The Nature of Public Enterprises." *Croom Helm*, London.
- Ramanadham, V.V. (1988). "Privatization in the U.K." *Routledge*, London.
- Ramanadham, V.V. (1989). "Privatization: The U.K. Experience and Developing Countries" in V.V. Ramanadham (ed), "Privatization in Developing Countries." *Routledge*, London.

- Ramsdell, J.W. (1985). "Physician Reimbursement for Services to HMO-sponsored Patients: An Academic Model." *Medical Care*, Vol. 23, pp. 1315-24.
- Raymond, Susan Ueber and Anne F. Glauber (1983). "Beyond the Public Prescription: Private and Public Roles in Near East Health." Center for Public Resources, New York.
- Reddy, Y. Venugopal (1989). "Privatization in India" in V.V. Ramanadham (ed), "Privatization in Developing Countries." Routledge, London.
- Relman, Arnold (1988). "Salaried Physicians and Economic Incentives." *New England Journal of Medicine*, Vol. 319, Number 2, p. 784.
- Ross, Stephen (1973). "The Economic Theory of Agency: the Principal's Problem." *American Economic Review*, Vol. 63.
- Roth, Gabriel (1987). "The Private Provision of Public Services in Developing Countries." Oxford University Press, U.K.
- Rowley, C.K. (1977). "Efficiency in the Public Sector." in C. Bowe (ed), "Industrial Efficiency and the Role of Government." Department of Industry, HMSO: London.
- Salkever, David S. (1978). "Competition Among Hospitals" in Warren Greenberg (ed), "Competition in the Health Care Sector." Aspen Systems Corporation, Maryland.
- Sappington, David E. M. and Joseph Stiglitz (1987). "Privatization, Information and Incentives." *Journal of Policy Analysis and Management*, Vol. 6, Number 4, pp. 567-582.
- Shanker, Albert (1987). Comment on Henry Levin's, "Education as a Public and Private Good." *Journal of Policy Analysis and Management*, Vol. 6, Number 4.
- Shirley, Mary (1989). "Reform of State-Owned Enterprises: Lessons from World Bank Lending." Policy and Research Report Number 4, The World Bank, Washington, D.C.
- Shisko, R. and B., Rostker (1976). "The Economics of Multiple Job-Holding." *American Economic Review*, Vol. 66, Number 3, pp. 298-308.
- Sims, P.D., D. Cabral, W. Daley, and L. Alfano (1984). "The Incentive Plan: An Approach For Modification For Physician Behavior." *American Journal of Public Health*, Vol. 74, pp. 150-2.
- Sloan, Frank A. and Roger Feldman (1978). "Competition Among Physicians" in Warren Greenberg (ed), "Competition in the Health Care Sector." Aspen Systems Corporation, Maryland.

- Smethurst R.G. (1987). "Privatization and Regulation." Seminar on Privatization, Templeton College, Oxford, Sept.-Dec.
- Stiglitz, J.E. and Andrew Weiss (1987). "Incentive Efforts of Terminations: Applications to the Credit and Labor Markets." *American Economic Review*, Vol. 73, pp. 912-27.
- Summers, Anita (1987). Comment on Henry Levin's, "Education as a Public and Private Good." *Journal of Policy Analysis and Management*, Vol. 6, Number 4.
- Tirole, Jean (1988). "The Theory of Industrial Organization." The MIT Press.
- van der Gaag, Jacques, Morton Stelcner and Wim Vijverberg (1989). "Public-Private Sector Wage Comparisons and Moonlighting in Developing Countries: Evidence from Cote d'Ivoire and Peru." LSMS Working Paper Number 52, The World Bank, Washington, D.C.
- Vuylsteke, Charles (1988). "Techniques of Privatization of State-Owned Enterprises: Methods and Implementation." Technical Paper Number 88, The World Bank, Washington, D.C.
- Welch, W. Pete (1990) "Giving Physicians Incentives to Contain Costs Under Medicaid." *Health Care Financing Review*, Vol. 12, Number 2.
- Woodward, R.S., and F. Warren-Boulton (1984). "Considering the Effects of Financial Incentives and Professional Ethics on Appropriate Medical Care." *Journal of Health Economics*, Vol. 3, pp. 223-37.
- World Bank (1992). "Pharmaceutical Expenditures and Cost Recovery Schemes in Sub-Saharan Africa." Technical Working Paper Number 4, Population, Health, and Nutrition Division.
- World Health Organization (1992). "The Public-Private Mix in National Health Systems and the Role of Ministries of Health." Summary Report of Interregional Meeting.
- Yao, Dennis (1987). Comment on David Sappington and Joseph Stiglitz's, "Privatization, Information and Incentives." *Journal of Policy Analysis and Management*, Vol. 6, Number 4.
- Zabalza, A. (1983). "The CES Utility Function, Non-Linear Budget Constraints and Labor Supply." *Economic Journal*, pp. 312-326.
- Zaidi, S.A. (1988). "The Political Economy of Health Care in Pakistan." Vanguard Books, Lahore, 1988.