Competition Promotion and the Prices of Drugs and Medicines

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The prices of drugs and medicines are considered to be at levels that produce inequalities as well as inefficiencies. Of particular concern are the variations across countries in the prices of drugs with the same brand, same maker and same dosage, and price variation locally among drugs of the same type, even among generics. Three solutions are surveyed: having government engage in the production and distribution of drugs, using government procurement, and promoting greater competition in the pharmaceutical industry. Obstacles to competition promotion are likewise discussed.

PUBLIC CONCERNS OVER THE PRICES OF DRUGS AND MEDICINES

THE PRICES OF DRUGS AND MEDICINES ARE CONSIDERED TO be at levels that produce inequities as well as inefficiencies. In particular, it is argued that the prices of drugs and medicines reduce access to medical care by the poor, reinforce irrational drug use and imply deadweight losses. On these grounds, various policy measures aimed at reducing drug prices have been proposed.

The most popular argument for price regulation is that the prices of drugs and medicines prevent consumers, especially the poor, from accessing appropriate medical services (HAIN 1990). Take the case of hospital care. Drugs and medicines take up to 60 percent of the average hospital bill, and the average hospital bill is three times the average monthly family income (NSO-FIES 1997). Relative to non-hospital ser-

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vices, estimated price elasticities for the utilization of hospital care ranges from −0.13 for a public facility to −3.0 for privately provided care (Tan 1998). This means that a 10 percent increase in the price of hospital care induced by increasing drug prices, will reduce utilization of publicly provided hospital services by 13 percent and that of private hospitals by 30 percent. The adverse price response is estimated to be larger for lower income groups.

A related concern is that prices that are not affordable lead to irrational drug use ranging from the use of ineffective remedies to non-compliance with prescribed dosages. Non-compliance is especially notable because it generates the negative externality of drug resistance.

It must be noted, however, that public concerns about access and irrational drug use do not point at price regulation as the appropriate policy response. An effective poverty alleviation program or demand-side subsidies via social insurance could be equally effective in improving access to drugs by the poor. Innovative treatment protocols like DOTS (Directly Observed Treatment, short-course) in tuberculosis (TB) control may be more effective in reducing non-compliance than setting price ceilings for TB drugs (TB Control Program).

The third concern is that drug prices reflect mark-ups over the cost of manufacturing and distributing drugs. Since drug companies obviously cannot practice perfect price discrimination, then the presence of such mark-ups imply deadweight losses (MasCollel, Whinston, Green 1995). This means that what is lost in terms of consumer surplus is larger than revenues from the mark-ups.

The validity of public concern over monopolistic pricing is difficult to establish owing to measurement and information problems. Traditional measures like market concentration ratios are inappropriate for the pharmaceutical industry. The share of the top four companies to total sales have been declining over the years—from 0.52 in 1981 to 0.41 in 1990 (Bolanos and Lao Guico 1992). With new entrants engendered by the implementation of the Generic Drugs Act of 1987, concentration ratios can be expected to be lower for recent years. The problem with concentration ratios is that they measure the overall dominance of a multi-product firm, not the dominance in the market of a specific drug. Patent holders like Pfizer would rank low in overall market

share but would obviously have a monopoly in the Viagra market. However, the data to measure market shares for specific drugs are not available.

Another approach to validate the exercise of monopoly power is to establish excess profits in the pharmaceutical industry. Should company reported financial statements be considered an unreliable source, one would have to discern profitability based on the stocks and bonds markets (Scherer 1993). But in the Philippines, drug companies are not listed. The information needed to directly establish mark-up pricing by drug companies is private to the companies themselves. Ideally, one has to decompose the price that consumers pay for drugs into costs and mark-ups from manufacturing, wholesaling and retailing. Indirect techniques of price decomposition like the estimation of hedonic price equations can eliminate the need for detailed firm level data. But the cost of undertaking consumer surveys to generate the data needed to estimate the price components of various types of drugs tends to be prohibitive.

TWO OBSERVATIONS ON THE PRICES OF DRUGS AND MEDICINES

THE current policy debate over drug prices revolves around two observations concerning price variation for similar drugs across countries and within the Philippines. The discussions have focused on what explains observed price variations, what the observations imply about the competitiveness of the pharmaceutical industry and what appropriate policy actions should be taken.

The first observation is that the retail prices of drugs with the same brand, same maker and same dosage vary widely across countries (see Table 1). Take for example a box of 100 250-mg tablets of amoxicillin (brand name Amoxil) by Smith Kline Beecham. Retail prices are observed to be as low as US$8 in Pakistan and as high as US$40 in Germany. The same drug is being retailed in the Philippines for US$29 and in Thailand for US$17.

The second observation is that the prices of drugs of the same type vary in the local market, even among generic drugs (see Table 2). Consider amoxicillin again as an example. Among generic products, the antibiotic is sold for as low as Php 220 for a box of 100 500-mg cap-

TABLE 1. Retail Prices of Selected Drugs in 1995 (in US$)

COUNTRY	Ranitidine (Zantac by Glaxo) 150mg/100 tabs	Amoxicillin (Amoxil by Smith Kline Beecham) 250mg/100 tabs	Captoril (Capoten by BMS) 25mg/100 tabs
India	3	10	*
Nepal	3	10	*
Australia	20	40	13
Bangladesh	33	*	*
Pakistan	39	8	21
Colombia	47	37	64
New Zealand	52	22	43
Mexico	57	*	41
Sri Lanka	63	24	25
Greece	71	*	40
W. Samoa	71	30	*
UK	73	27	*
Thailand	74	17	33
Italy	77	*	37
Canada	81	14	*
Malaysia	86	34	54
Zimbabwe	87	24	53
Philippines	95	29	54
France	99	37	44
Hong Kong	119	*	47
Belgium	128	*	68
Netherlands	131	40	43
Germany	149	*	40
Indonesia	150	40	*
Finland	156	*	*
US	169	36	76
Switzerland	284	*	*
China	*	*	*
Latvia	*	18	*
Tanzania	*	*	*

Source: 'Retail Prices in the Asia-Pacific Region' *HAIN* News No.86, December 1995

TABLE 2. Domestic Retail Prices of Selected Drugs

Amoxicillin 500 mg/capsule 100's box in 1998 PhP

	Manufacturer	Price
Low Generic	Axon	220.00
Medium Generic	First Fil-Bio	439.50
High Generic	Unilab	830.00
Low Branded	Victrocin by Boie	759.05
Medium Branded	Termox by Solvang	1,273.55
High Branded	Amoxil Forte by Smith Kline Beecham	1,810.22

Paracetamol 500 mg/tablet 100's box

	Manufacturer	Price
Low Generic	DMLI	12.00
Medium Generic	Pacific	45.00
High Generic	Unilab	74.00
Low Branded	Dolexpel by Morishita-Seggs	87.38
Medium Branded	Cretan by Ethnol	274.20
High Branded	Medicol-A by Unilab	656.15

Rifampicin 450mg/capsule 100's box

	Manufacturer	Price
Low Generic	Axon	440.00
Medium Generic	Pacific	480.00
High Generic	Alman	510.00
Low Branded	Koshmed by Vitalink	577.00
Medium Branded	Rexilan by Am-Europharma	1,233.54
High Branded	Fampisec by San Marino	1,995.70

Source: Bureau of Food and Drugs

sules to as high as Php 830. The lowest priced branded amoxicillin is sold at Php 759—cheaper than the highest priced generics. The highest priced branded amoxicillin is sold for as low as Php 220 for a box of 100 500-mg capsules to as high as Php 830. The lowest priced branded amoxicillin is sold at Php 759—cheaper than the highest priced generics. The highest priced branded amoxicillin is sold at Php 1800—over eight times the price of the cheapest generic product.

ALTERNATIVE EXPLANATIONS OF THE TWO OBSERVATIONS

WHETHER or not government should intervene to address public concerns over drug prices and what appropriate policy action should be taken largely depends on how one explains the two observations made earlier. In the policy debate, pharmaceutical companies have stressed cost and quality differences to explain price differences. On the other hand, advocates of public intervention have emphasized international and local monopolistic pricing practices.

With regard to international price variations, three alternative explanations have been offered. One is that after taking into account differences in taxes and regulatory regimes, price differences are largely due to cross-country differences in manufacturing and distribution costs (Reekie 1996). Government subsidies in manufacturing are believed to be what makes drugs and medicines cheaper in South Asian countries. Cost structures also vary substantially across countries, especially the share of distribution costs. In particular, it is often pointed out that unlike other Southeast Asian countries, the Philippines spends more on sales, promotion and advertising. The cost of goods sold accounts for only 50 percent while distribution costs account for 25 percent. The remainder goes to administration, R&D, royalties, interest charges, taxes and profits (Bolanos and Lao Guico 1992). An anecdote used to emphasize the point is that in Manila sales personnel use cars while their counterparts in Jakarta use motorbikes.

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Studies show that apart from cost differences, international price variations are determined by differences in demand conditions. Al-

though criticized for not using robust product measures (or baskets), cross-country studies have suggested that multinational pharmaceutical companies practice international price discrimination—that is, companies charge prices equal to what the domestic market can bear (Schut and van Bergeijk 1986). In effect, multinationals charge a mark-up based on domestic demand price elasticities.

But the question that begs to be asked is why international price differences prevail at all, regardless of whether cost differences or price discrimination is the valid explanation. The market response to cross-country price differentials is arbitrage. And the quickest way to make money is to buy low and sell high. But why has this market response not dissipated price differences between the Philippines and the rest of the world?

Consider the case of 100 25-mg tablets of Captoril by BMS (see Table 1). In 1995 the product was being sold in the Philippines for US$54. In Australia, the same product was retailed for only US$13. Assuming an importation cost of 100 percent (freight and duties included), the landed cost of Captoril from Australia would be US$26. This would leave US$28 for marketing, distribution and profits. But why are Filipino and Australian traders not engaged in arbitrage or parallel importation?

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As shall be discussed in a later section, trade barriers exist to prevent international trade from dissipating cross-country price differences. Despite the substantial decline in tariffs on pharmaceuticals (from 15 percent to 3 percent in the last decade), international trade has not produced enough pressure for local drug prices to decline (relative to prices abroad). Non-tariff barriers have effectively shut out parallel drug imports from domestic markets. Specifically, a law designed to protect consumers from counterfeit drugs is now being implemented in a manner that considers parallel imports as counterfeit.

Three similar arguments are presented to explain the second observation concerning domestic drug price differentials. One argument

is that there are substantial differences in manufacturing and distribution costs among drug companies. There is a lack of studies on scale and scope economies but industry profiles suggest that cost differences might be substantial in the area of marketing and distribution (Bolanos and Lao Guico 1992). The components of marketing and distribution costs that reportedly vary substantially among drug companies are advertising, entertainment and representation, and distribution of drug samples.

A related explanation is that domestic price differentials reflect quality differences especially in bio-efficacy—that is, how fast a drug is absorbed, the effectiveness of its active ingredient and the absence of adverse side-effects. The Bureau of Food and Drugs (BFAD) does not require tests for bio-efficacy. Hence, local manufacturers are left on their own to vouch for the quality of their products. Multinational drug companies use their having passed rigorous tests by the US Food and Drugs Administration (FDA) to differentiate the quality of their products.

The third explanation is related to the implementation of the Generic Drugs Act, which requires the use of generic names in labeling, advertising and prescriptions. In response to this regulation, generic drug manufacturers entered the industry and brand name manufacturers produced generic drug products. Worldwide experience suggests that with the introduction of generics, the average price of drugs and medicines tend to decline. However, recent studies (Frank and Salkever 1995) on individual drugs find evidence that the prices of branded medicines have increased alongside price reductions in generic drugs. This finding suggests that with generics, pharmaceuticals can practice second-degree price discrimination. This means that drug companies use branded versus generic drug products to discern differences in price elasticities and then charge the corresponding mark-ups.

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THREE GENERIC SOLUTIONS TO REDUCE THE PRICE OF DRUGS AND MEDICINES

THREE generic solutions covering the ideological spectrum have been proposed to address public concern over the prices of drugs and medicines. On the extreme left are proposals for government production and distribution of drugs and medicines. At the center are proposals to leverage existing government procurement of drugs and medicines for price reductions. At the extreme right are proposals to use competition promotion to reduce drug prices.

If drug prices contained substantial mark-ups, then in theory government can exert pressure to reduce prices by going into drug manufacturing and distribution itself. Government owned and operated drug companies can then be mandated to set prices at marginal costs (or at short-run average costs to recover fixed costs). Private companies would then have to adjust prices in order to keep their market share from being eroded by public enterprises.

But the experiences with public enterprises established for similar reasons in other areas such as in agriculture, the petroleum industry and banking have been disappointing: waste and inefficiencies owing to public subsidies and wage structures that are not anchored on performance. In effect, public enterprises fail to realize their potential as a regulatory instrument largely because of the inability of government to enforce and monitor efficiency mandates. In some cases, private sector interests capture public enterprise behavior.

The second solution involves using government procurement to reduce drug prices. If government had information on costs, it can set a reference price to guide procurement for drugs and medicines used by public health facilities and for reimbursements by the social health insurance program.

The effectiveness of this solution, however, largely depends on the size of government procurement relative to the drugs market. In 1997, expenditures by local and national health facilities accounted for only 40 percent of total national expenditures (NSO–Philippine National Health Accounts 1997). But the leverage potential of such spending is substantially less because government health budgets are spent largely on personnel. Moreover, autonomous local government units do more than

half of government health spending. The national health insurance program has the most potential for using procurement as a regulatory instrument. At the moment, however, social insurance accounts for only seven percent of total national spending.

It should be noted that even if the amount procured by government were substantial, it would require reliable information on drug manufacturing and distribution costs. Setting price references too low will lead to shortages in drugs in government facilities. Setting prices too high will effectively transfer informational rents to drug suppliers.

The third approach is for government to promote greater competition in the pharmaceutical industry by removing trade barriers and facilitating parallel importation. The overall effectiveness of letting parallel imports exert competitive pressures on existing drug companies will depend on the size of price differences here and abroad, the facility with which new drug traders enter and the number of entrants. As suggested by Table 1 and Table 2, the price differentials for certain types of drugs may be attractive to new entrants.

There are technical difficulties with promoting parallel importation that government needs to address. This is discussed in detail in the next section. Moreover, even without these technical issues, competition promotion might not be considered politically attractive. It can be perceived as non-action. And its success is highly dependent on factors outside the control of government (that is, the number of new entrants). A case in point is the failure of oil deregulation to deliver on its promise to lower the prices of petroleum products.

OBSTACLES TO COMPLETE PROMOTION VIA PARALLEL IMPORTATION

THERE are three obstacles to competition promotion that government needs to address. One set refers to existing non-tariff trade barriers. The second concerns the dominance of a single company in drug distribution. The third has to do with limited government capacity to provide information on quality and prices as public goods.

Non-tariff barriers. As mentioned earlier, the biggest obstacle to parallel imports is the implementation of the Counterfeit Drugs Law

of 1997, which requires the BFAD to distinguish counterfeit drugs from registered locally manufactured drugs, registered imported drugs and unregistered imported drugs. Current registration requirements for drug importers do not cover registered importers bringing in counterfeit drugs. The implementing rules of the law address this requirement by stating that:

> If the unregistered imported drug product has a registered counterpart brand in the Philippines, their product shall be considered counterfeit (Rule 1, Interpretation and Definition of Terms, irr of RA 8203)

Once this definition is amended, then the Counterfeit Drug Law will cease to deter unregistered imported drugs. However, the next hurdle would be for the importer to meet licensing requirements to be able to actually sell the unregistered imported drugs locally. Requirements for registration include:

a) Foreign agency agreement between the Philippine importer and foreign supplier duly authenticated by the territorial Philippine Consulate;
b) Certification that the manufacturer of the raw material, active ingredient and/or finished product is registered in the country of origin, duly authenticated by the territorial Philippine Consulate, and evidence that the manufacturer meets BFAD standards for local manufacturers; and
c) Certification of free sale of the products in the country of origin duly authenticated by the territorial Philippine Consulate and evidence that such certificate is issued in substantial compliance with BFAD standards.

These requirements may have to be amended if parallel imports are to be facilitated. For example, requirement (a) must be amended because it limits drug importers to individuals who are agents of product license holders. If one wants to simply purchase the medicines from a third country distributor/retailer, one may not be able to secure a foreign agency agreement.

Requirement (b) and (c) are consistent with the World Health Organization (WHO) scheme referred to as a Certificate of a Pharma-

ceutical Product. However, both also need to be changed. In response to the growing international trade in medicines, the World Health Assembly adopted in 1975 a certification scheme on the quality of pharmaceutical products moving in international trade. Called the WHO Scheme, it is a voluntary scheme wherein countries that sign up can use the regulatory decisions made by exporting countries. The scheme will help importing countries obtain:

- Assurances that a given product has been authorized to be placed on the market in the exporting country;
- Assurances that the manufacturing plant in which the product is produced is subject to inspections at suitable interventions, and conforms to good manufacturing practices and quality control; and
- Information on the implementation of inspection and control exercised by the authorities of the exporting countries.

Operationally, regulatory agencies in an importing country can ask for a 'Certificate of a Pharmaceutical Product' with the costs of the request charged to the applying drug importer. The Certificate will state whether the product has been licensed for what indications, good manufacturing practices (GMP) and Quality Analysis (QA) controls. The WHO recommends that its intended use by a competent authority in an importing country is for product license, license renewal and extension and/or review.

A document that is much simpler than this is the 'Statement of Licensing Status' which states simply that a license has been given to the product for use in the exporting country.

A third document is the Batch Certificate of a Pharmaceutical Product. This attests to the quality and expiry date of a particular batch of medicines and is intended to accompany a specific batch or consignment of a licensed product. To promote parallel imports, we can have a system where the Certificate of a Pharmaceutical Product with all its statements on GMP and QA controls can be requested from the original country where the medicines were manufactured. From the third country where the parallel importer will procure the medicines, a 'State-

ment of Licensing Status' and a certificate analogous to the 'Batch Certificate' will be a requirement.

Limited BFAD capacity. Relaxing licensing requirements to facilitate parallel imports will open the domestic market to substandard imports and even counterfeit drugs. This concern brings us to the second obstacle—the inability of BFAD to monitor and test for the quality of drugs. This weakness also helps preserve consumer (and doctor) preference for imported branded drugs since locally produced medicines (branded or unbranded) do not go through the same tests imported drugs undertake.

The Department of Health is mandated to establish standards and quality measures for drugs and adopt measures to ensure the production of safe, efficacious and good quality drugs and devices in the Philippines. This mandate is implemented through BFAD which must ensure that drugs distributed in the country meet safety, efficacy and quality or purity standards.

How does BFAD operationalize its mandate as provided by law (RA 3720)? BFAD requires any person desiring to distribute medicines to first submit to the BFAD the following documents:

- Reports of investigations which have been made to show whether or not such drug or device is safe, efficacious and of good quality for use based on clinical studies conducted in the Philippines;
- Full list of the articles used as components of such drug or device;
- Full statement of the composition of such drug or device;
- Full description of the methods used in and the facilities and controls used for the manufacture of such drug or device;
- Samples of such drug or device and of the articles used as components thereof as the Department may require;
- Specimens of the labeling proposed to be used for such drug or device;
- Labels that include the name and country of manufacture, dates of manufacture and expiration date; and

- Other requirements as may be prescribed by regulations to ensure safety, efficacy and good quality of such drug and device.

BFAD has the power to verify the validity of all the claims in these documents. This includes spot visits of the manufacturing sites and the conduct of an assay test.

The most crucial requirement is that reports on the safety, effectiveness and quality of the medicines must be based on clinical studies conducted in the Philippines. However, this requirement is not strongly followed as BFAD may license a medicine based on reports of clinical studies done in other countries. Nonetheless, BFAD does require post-marketing surveillance (PMS) for three years of all new drug applications. BFAD calls the PMS a Phase IV clinical trial although this point is much debated. The present design with an arbitrary sample size of 3,000 can be significantly improved.

From the listing above, it can be construed that all one needs for applications for a new drug are paper submissions. Indeed, to hasten the applications of several new drugs that have created a backlog for many years, BFAD now requires paper submissions for drug registration. According to BFAD, no laboratory exams are being done. And to think that the tests that BFAD usually does are mainly assay tests and solubility tests.

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The technical competence of BFAD plays an important role in competition promotion. It will have to ensure that parallel imports are safe and efficacious. Moreover, it will have to effectively provide consumers the information needed to identify the relative quality of domestically produced drugs and imported drugs, whether branded or generic.

Upgrading BFAD means enhancing its capacity to assess purity, efficacy, quality and safety. It also means strengthening its capacity to monitor the drug chain from manufacturing/importation down to the retail outlet once a drug is approved for the market.

The purity test is the easiest to conduct, as it is a mere assay test to measure the chemical composition of the medicines. All drugs should undergo this test. Furthermore, BFAD must do regular purchase/collection of drugs in the market for assays up to two years after registration.

In addition to the assay test, BFAD should do a stability test for all registered drugs. Stability is the ability of the drug to retain its properties within specified limits throughout its shelf life.

BFAD should also be rigorous in labeling requirements, particularly the manufacturer's name, importer/distributor's name, batch number and expiry date. For parallel imports, the Batch Certificate is a crucial document. This helps ensure that counterfeit drugs will not be passed on as parallel imports.

Quality, more than anything else, is a measure of the manufacturing process. With importers, the Certificate of Pharmaceutical Product from the country of manufacture would be sufficient to ascertain quality. For parallel importers, we must find a way to convince mother countries to give this certificate even if the drugs are bought from a third party. In the case of local manufacturers, particularly generic drug manufacturers, BFAD has to expand its capacity to inspect and monitor local manufacturing processes.

With regard to efficacy and safety, drugs should be classified into innovator/patented drugs and generic copies. With respect to generics, the important issue is whether the generic copy meets interchangeability and drug switchability standards. Such standards can be tested by equivalence studies such as bioequivalence, pharmacodynamic studies and clinical trials.

Apart from using these tests to screen for quality, the information produced by such tests must be effectively relayed to consumers and doctors. The current regulatory regime only requires drug companies to meet minimum standards—that is, the purity test. Without having to change the law mandating such requirements, BFAD can introduce a voluntary scheme where drug products are tested for bioequivalence. Medicines that pass such tests should then be marked with a seal indicating higher quality. In effect the seal should help eliminate questions

concerning quality differences between imported, local, branded and generic drugs. With the seal of higher quality, the remaining issue that the consumer confronts is price.

Distribution choke point. The third obstacle to competition promotion is the dominance of a single company in wholesaling and distribution. Up to 80 percent of drug companies uses the distribution network of Zuellig Pharma (BFAD 1999). A single company also dominates retailing: the Mercury Drug chain represents 60 percent of the retail market.

One concern is that parallel imports can be denied access to the distribution facility controlled by these two dominant firms in order to reduce competitive pressure on its regular clients. But a more serious concern is that potential price gains from parallel imports can be eroded as the dominant distributor and retailer exercise market power by charging mark-ups over distribution and retailing costs.

These two issues bring back proposals for government to establish an alternative distribution network. The open access public health delivery system can be organized as a distribution network composed of hospitals (national, regional, provincial and district) and health centers.

The physical infrastructure and location pattern required of an effective distribution network is in place. What needs to be built is the information and management infrastructure that would allow these facilities to function as a network especially since most of these facilities are financed and operated independently by local government units. Moreover, the pharmacies in these facilities will have to develop the capacity to serve not only their patients but also the general consumer. The pharmacies in government health facilities will have to be transformed into a drug retail chain.

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A way for government to avoid having to put up the investment requirements of building an alternative distribution system is to have private concessionaires build and operate the network (or parts of it).

Concessionaire contracts should be competitively auctioned. Winners can be chosen on the basis of investment commitments, proposed price caps on critical drugs and possibly even rent.

REFERENCES

BFAD (Bureau of Food and Drugs) Report. 1999.

Bolanos, MS and CS Lao Guico. 1992. A Study on the Market Concentration of the Philippine Pharmaceutical Industry. Undergraduate thesis, School of Economics, University of the Philippines.

Frank, RG and DS Salkever. 1995. *Generic Entry and the Pricing of Pharmaceuticals*. Cambridge, Massachusetts: National Bureau of Economic Research.

HAIN (Health Action Information Network). 1990. *Drug Monitor*, 5(2).

Mas-Colell, A, MD Whinston and JR Green. 1995. *Microeconomic Theory*. New York: Oxford University Press.

NSO (National Statistics Office). 1997. Family Income and Expenditure Survey.

NSO (National Statistics Office). 1997. Philippine National Health Accounts.

Reekie, WD. 1996. *Medicine Prices and Innovations: An International Survey*. London: IEA Health and Welfare Unit.

Scherer, FM. 1993. Pricing, Profits and Technological Progress in the Pharmaceutical Industry. *Journal of Economic Perspectives*, 7(3): 97-115.

Schut, FT and PAG van Bergeijk. 1986. International Price Discrimination: the Pharmaceutical Industry. *World Development*, 14(9): 1141-1150.

Tan, C. 1998. Econometric Analysis of Demand for Hospital Care. Working paper, School of Economics, University of the Philippines.