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Demand for Private Health Insurance Where Public Health Services are Free: The Case of Malawi

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Abstract: This study assesses the determinants of demand for private health insurance among formal sector employees in Malawi using a multinomial logit. We examine membership in the three different schemes of Medical Aid Society of Malawi's (MASM), which was the only health insurance provider at the time of the study. The results indicate that formal sector employees prefer to receive medical treatment from private health facilities, but lack of access to information prevents many from becoming insured. Further, the probability of enrolling in any of MASM's schemes increases with income and with age for the top and minimum schemes. More children and good health status reduce the probability of enrolling into the two lower schemes. Policies that improve access to information and income among the target group are likely to increase demand for MASM schemes.

Key words: MASIM, private health insurance, multinomial logit

INTRODUCTION

The United Nations' Millennium Development Goals (MDGs) emphasis on health-related issues, (reduce child mortality, improve maternal health and combat HIV and AIDS, malaria and other diseases) underscores the fact that health and development are inherently intertwined. However, great strides must be made in the health sector if the MDGs are to be realized in the sub-Saharan African countries. Currently, the health care systems in most developing countries are facing dwindling budget allocations. In Malawi, the resource envelope for the health sector is very small and this has given rise to dilapidated buildings, non-functional equipment, lack of drugs and supplies in hospitals and poorly motivated health workers.

The heath sector in Malawi is organized primarily around the activities of the Ministry of Health which plays the dual role of policy making as well as health care provision. More than 60% of all health services in Malawi are provided by the government and are free at the point of consumption. Private health care providers comprise the private-for-profit sub-sector and the non-profit private sector. The latter are mainly Christian hospitals grouped under the Christian Health Association of Malawi (CHAM), which provides medical services at variable charges, accounting for over 20% (Anonymous, 2001). The for-profit private clinics are also increasing in Malawi.

Malawis public expenditure on health is among the lowest in the sub-Saharan African region at only 8.4% of general government expenditure. This is even lower than the Southern African Development Communitys (SADC) average of 13.7% (Anonymous, 2000). In per capita terms, government expenditure on health services was around US$11 between 1997 and 2000 compared to US $21 for low-income countries (Anonymous, 2003). The current physician/patient ratio is 1.1 to 100,000 and there are 1.3 beds per 1,000 patients (Anonymous, 2006a). As such, government expenditure on health is insufficient to address the health challenges the country continues to face. The low overall expenditure levels are one explanatory factor of Malawis poor health indicators. Life expectancy at birth stood at 41 years for both males and females in 2004. The infant mortality rate was 109 per 1,000 live births in 2004. Maternal mortality rate is among the highest in the world at 1,800 per 100,000 live births in 2000 (Anonymous, 2006b).

Over time, the government has been shifting the burden of ensuring citizens' access to effective health care to the private pocket. Estimated out-of-pocket expenditures by households on health services have been on the rise and involving a growing number and diverse range of private-for-profit players. From US$9.1 million in 1995, private expenses increased to US$ 37.1 million in 2000 while the share of private expenditure on health to GDP was 4% compared to governments contribution of 3.6% (Anonymous, 2001). Patients are seeking better quality care at the fast-growing, private health facilities. This scenario is now making private health insurance relevant in Malawi.

The health insurance industry in Malawi is underdeveloped. Before the establishment of OASIZ

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Medical Aid in 2003, the MASM was the only third party institution in the industry. The MASM is a non-profit-making organization, which assists its members to access medical support and services through three schemes. The most comprehensive scheme is the VIP scheme, with a monthly premium of MK 3,000[2] per person in 2007 (MK 1,500 in 2002) and catering for treatment in any country in the Southern African region. The Executive Scheme requires a lower monthly contribution of MK 1,140 per person in 2007 (MK 700 in 2002). It covers payments for medical treatment up to MK 603,000 per annum from government, mission and private hospitals and clinics registered with MASM. The last scheme, EconoPlan which caters for low-income individuals, has a current monthly premium of MK 480 per person for treatment as in the Executive Scheme. Contributions to MASM are payable monthly, quarterly or annually and the maximum joining age limit is 55 years. MASM reimburses the costs of consultations, prescriptions and treatment at a rate dependent on the type of coverage chosen.

As health expenditure is increasingly becoming an important component of household budgets in Malawi, health insurance is bound to become attractive because consumers are more able and prefer, to pay regular, affordable premiums rather than paying fees for treatment when they are ill. However, most households are still not covered by any medical insurance and no studies have been conducted to find out why many Malawians do not opt for health insurance to cover such expenses. This study aims at filling this gap in knowledge. The paper, therefore, assesses the determinants of demand for private health insurance among formal sector employees in Malawi. In particular, the study will attempt to answer the following questions: a) What is the extent to which formal sector employees prefer to receive treatment from private health facilities where health insurance is relevant?; b) What is the role of information and/or income on demand for MASM schemes?; c) What are the factors that determine an individuals specific participation in any of the three schemes offered by MASM?

Although empirical literature on demand for health insurance continues to increase, most of them are from the developed countries where health care systems, in general and health insurance industries in particular, are advanced. Such studies are lacking in sub-Saharan Africa. Among the most recent studies include one on private health insurance in the Irish health care system (Finn and Halmon, 2006). Using a 7 year panel data, the study models the propensity to insure as a function of individual and household characteristics. The study finds that while education, income and to a lesser extent, health status have very large effects on probability of insuring, these effects are overestimated where no attempt is made to control for unobserved heterogeneity or state dependence. Costa-Font and Garcia (1999) studied the determinants of demand for private health insurance in Catalonia region of Spain by modeling demand for private health insurance as a demand for health care quality in the National Health System (NHS). The study identified a quality gap between public and private health insurance in the NHS. One of the major significant findings from the study was that a rise in private health insurance quality enhances an equal influence in the demand for private health insurance.

Two studies have examined the demand for private health insurance as an alternative to government or statutory schemes in Taiwan (Liu and Chen, 2002) and Germany (Thomson *et al*., 2002). In Taiwan, the key findings were that income and education had a positive impact on the demand for private insurance, as was whether the respondent was a married female and working in a state-run enterprise. The German study finds that the alternative voluntary health scheme attracted a minority who had incomes above a minimum threshold and that the marginal benefits did not outweigh the costs in terms of choice of service provider or services provided. Furthermore, voluntary health schemes penalized those with dependents, the elderly and those in poor health.

Among the few studies from Africa include Kirigia *et al*. (2005) who examined the relationship between health insurance ownership and demographic, economic and educational characteristics of South African women. The study was based on a sample of 3,489 women from a South African cross-sectional household survey. The findings, based on a logit model, indicate that area of residence, income, education, marital status and smoking were the major determinants of private health insurance.

Theoretical framework: The theory of demand for insurance is based on expected utility theory of von Neumann and Morgenstern (1944). The conventional theory of health insurance contends that people purchase insurance to protect themselves from the financial risk of illness. The underlying assumption is that risk-averse individuals prefer certain losses over uncertain ones of the same expected magnitude. Following Nyman (1999), the framework considers health insurance as not only a risk-avoidance mechanism but also a way of ensuring access to quality health care in the context of Malawi.

We consider a risk-averse individual who derives utility from disposable income (Y) and from health (H). H is a function of Medical care (μ). We assume that the individual is confronted with two states of the world, the health state (h) and the sick state (s). Each state has an associated health and income levels, so that:

$u^s = u^s(Y, \mu)$ and
$u^h = u^h(Y, \mu)$

Where, $u_Y > 0$ and $u_{YY} < 0$. We further assume that $u^s_\mu > 0$ but $u^h_\mu = 0$ because having medical care when one is not sick may not be of any value. The expected utility theory assumes that the individual strives to maximize the expected value of his utility function. Assuming that the probability of falling ill (s) is σ, where, $0 < \sigma < 1$ and that μ can only be purchased out-of-pocket or through insurance payoff and if we let P, W and I denote insurance premium, gross wealth and insurance payoff, respectively, we can analyze the individuals expected utility with insurance and without it. When the individual decides to buy insurance his disposable income, Y, becomes:

$$Y = W-\mu-P+I$$

Assuming the individual is now confronted with an illness where, $\mu < W$ and that the insurance is fair ($\sigma\mu = P$) and that he has a comprehensive insurance cover ($I = \mu$) then his expected utility without insurance EU_1 and with insurance EU_2 are now presented:

$$EU_1 = \sigma u^S [W-\mu, \mu]+(1-\sigma)u^h [W, 0] \quad (1)$$

$$EU_2 = \sigma u^S [W-\mu-P+I, \mu]+(1-\sigma)u^h [W-P, 0]$$
$$EU_2 = \sigma u^S [W-P, \mu]+(1-\sigma)u^h [W-P, 0] \quad (2)$$

Without insurance the individual has a probability σ of losing μ, but with insurance he has the certainty of only losing P, as insurance premium. Since there is an expected utility gain with insurance, the risk-averse individual would opt for insurance.

Analytical framework: Demand for health insurance in MASM is analyzed using a logistic regression. Based on Scott Long (1997), the MNLM as a probability model can be derived as follows:

Let y be the dependent variable with J nominal outcomes. Although the categories are numbered 1 to J, they are not assumed to be ordered. Let pr(y = m|x) be the probability of observing a particular outcome m given x. The probability model for y can now be constructed as follows:

Assume that pr(y = m|x) is a function of the linear combination $x\beta_m$. The vector $\beta_m = (\beta_{0om} \ldots \beta_{km}\ \beta_{km})'$ includes the intercept β_{0m} and coefficients β_{km} for the effect of x_k on outcome m. To ensure that the probabilities are nonnegative, we take the exponential of $x\beta_m$: $\exp(x\beta_m)$. Although the result is nonnegative, the sum does not equal 1, which it must for probabilities. The third step, therefore, involves restrictions to make the probabilities sum to 1. We thus divide $\exp(x\beta_m)$ by $\sum_{j=1}^{J}\exp(x\beta_j)$:

$$\Pr(y_i = m \mid x_i) = \frac{\exp(x_i\beta_m)}{\sum_{j=1}^{J}\exp(x_i\beta_j)} \quad (3)$$

This normalization ensures that

$$\sum_{m=1}^{J}\Pr(y = m \mid x) = 1$$

However, the model is unidentified since more than one set of parameters generates the same probabilities of the observed. By multiplying Eq. 3 by

$$\frac{\exp(x\xi)}{\exp(x\xi)}$$

it can be shown that the model is not identified. Since the operation is the same as multiplying by 1, the value of the probability remains the same:

$$\Pr(y_i = m \mid x_i) = \frac{\exp(x_i\beta_m)}{\sum_{j=1}^{J}\exp(x_i\beta_j)} \times \frac{\exp(x_i\xi)}{\exp(x_i\xi)}$$

$$= \frac{\exp(x_i\beta_m + x_i\xi)}{\sum_{j=1}^{J}\exp(x_i\beta_j + x_i\xi)}$$

$$= \frac{\exp(x_i[\beta_m + \xi])}{\sum_{j=1}^{J}\exp(x_i[\beta_j + \xi])}$$

Although the values of the probabilities have not changed, the original parameters β_m have been replaced by $\beta_m + \xi$. Thus, for every $\xi \neq 0$ there is a different set of parameters that results in the same predictions. Clearly, the model is not identified.

In order to make the model identified, restrictions are imposed on the β's, such that for any nonzero ξ the constraints are violated. This is achieved by constraining one of the β's to equal 0, such as $\beta_1 = 0$, or $\beta_2 = 0$, or $\beta_J = 0$. The choice is arbitrary. In the study we set $\beta_J = 0$. Clearly, if a nonzero ξ is added to β_J, the assumption that $\beta_J = 0$ is violated. Adding this constraint to the model results in the probability equation given as:

$$\Pr(y_i = m \mid x_i) = \frac{\exp(x_i\beta_m)}{\sum_{j=1}^{J}\exp(x_i\beta_j)} \quad \text{where, } \beta_J = 0. \quad (4)$$

Model Specification: Demand for private health insurance should be understood as a prediction of enrolment in MASM as a member, depending on a number of explanatory variables. The model that is used in the study (derived in Eq. 4) is given as:

$$\text{pr}(y_i = m \mid x_i) = \frac{\exp(x_i\beta_m)}{\sum_{j=1}^{4}\exp(x_i\beta_j)} \quad \text{where, } \beta_4 = 0 \tag{5}$$

Where:

x_i = The vector of covariates for respondent i
β_m = The coefficient vector for choice of membership into MASM
J = The number of choices

Data: The study uses primary data from 221 individuals collected in the cities of Blantyre and Zomba in 2003. Blantyre is the largest commercial city and Zomba is the fourth largest city in Malawi. A stratified random sampling method was used and 41.6% of the sample was female. The data was used to derive important variables that are expected to influence the demand for health insurance (Table 1). Our response variable is membership into MASM, which has four categories: VIP scheme, Executive scheme, Econo Plan and not member.

The choice, as well as the expected signs of the explanatory variables were guided by earlier studies including Christiansen *et al*. (2002), Costa and Garcia (1999), Liu and Chen (2002) and Kirigia *et al*. (2005). There are no marked differences between those with insurance and those without as far as gender and age are concerned. The mean monthly disposable income for those with insurance is significantly larger (at 5% level) than those without it. It is also observed that mean school age, average age and the mean number of children are all statistically different at 5% level (Table 2).

Table 1: Description of independent variables

Variables	Description	Expected sign
Children	Number of children for individual i	+
Gender, male = 1, female = 0	Sex of individual i	
Age	Age of individual i	+
Age squared	Age of individual i squared	-
Schoolyears	Length of schooling for individual i	+
Health status 1	Excellent self-reported health status for individual i	+
Health status 2	Fair self-reported health status for individual i	+
Health status 3	Poor self-reported health status for individual i	-
Income	Total monthly income for individual i	+

Table 2: Descriptive statistics of selected variables

Variables	With insurance (n = 148)	Without Insurance (n = 73)
Gender (Male)	83 (56.1%)	43 (58.9%)
Gender (Female)	65 (43.9%)	30 (41.1%)
Mean age	36.4	35.8
Mean school years	15	12
Mean number of children	3.2	4.7
Excellent health status	50 (33.78%)	17 (23.29%)
Fair health status	76 (51.35 %)	43 (58.90%)
Poor health status	22 (14.87 %)	13 (17.81%)
Mean disposable monthly income	MK 18,410	MK 8,924

Table 3: Factors affecting demand for various insurance scheme

	VIP scheme		Executive scheme		Econo plan scheme	
Variables	β	p>z	β	p>z	β	p>z
Gender	-1.0410	0.107	-0.0732	0.865	-0.4489	0.865
Age	1.3170	0.030**	0.4089	0.233	0.6722	0.053*
Age squared	-0.0180	0.024**	-0.0055	0.218	-0.0089	0.068*
Children	-0.0520	0.871	-0.3849	0.057*	-0.6312	0.057*
Income	0.0004	0.000***	0.00038	0.000***	0.00032	0.000***
Schoolyears	-0.3850	0.013**	-0.1083	0.353	-0.0617	0.353
Health status 1	-13.8180	0.219	-14.8050	0.020**	-14.9894	0.020**
Health status 2	-13.1700	0.237	-14.9755	0.018**	-15.7949	0.018**

Note: Hstatus 3 was dropped to avoid the problem of matrix singularity, *: Denotes significance at 10% level, **: Denotes significance at 5% level and ***: Denotes significance at 1% level

RESULTS AND DISCUSSION

The Wald Test was used to test the importance of each of the variables in the multinomial system, i.e., whether all the variables have a significant effect on choosing a particular type of scheme, against the baseline choice (no insurance scheme). The results (not presented here) show that at 1% level of significance all the nine variables have a significant joint impact on the probability of choosing each of the three schemes.

Next we tested whether the direct impact of monthly income has the same impact on an individual's choice of a particular scheme as it does for another scheme. The results indicate that the impact of total monthly income on an individual's choice of the VIP Scheme and the Executive Scheme was not equal, at 1% level of significance. At the same significance level of 1%, we also reject the hypothesis that the impact of total monthly income on the VIP and the EconoPlan Scheme is equal. However, for the Executive and the EconoPlan Schemes, the null hypothesis can only be rejected at 10% level of significance. The results of the multinomial logit regression are presented in Table 3.

Under the VIP Scheme, Age, Age Squared and Income were significant with the expected signs at the 5 or 1% levels. *Schoolyears* is significant at 5% level with a negative sign, contrary to expectations. Thus, age positively influences the probability of VIP scheme membership up to 55 years (enrolment age limit) and becomes a negative influence thereafter, while income also has a positive influence on this more expensive but better scheme. *Schoolyears* was used in the study as a proxy for the general knowledge on the benefits of being healthy. But there is a strong possibility in Malawi that for the VIP scheme this variable could be picking up other effects, such as job category, income and insurance entitlements by type of employer. In the sample 38 % of the respondents had post-secondary education (Table 3).

For the Executive Scheme, only Income was significant with the expected sign at 1% level. Children was significant at 10% level with a negative sign while Health Status 1, Health Status 2, were also significant at 5% level and again with a negative sign. Age, Age Squared and School years which were important variables in explaining the probability of having a VIP Scheme, did not influence an individuals probability of having an Executive Scheme. These findings show that respondents demanding the Executive Scheme tended to be influenced positively by their income levels, negatively by household size which restricts ability and/or willingness to pay and also negatively by whether they were in excellent or fair health. Compared to the demand for the VIP Scheme these findings give Executive scheme the hallmark of a necessity. This would still be out of reach for those with more children who might have greater need for an intermediate scheme to moderate premium payments and out-of-pocket expenses.

The results suggest that there is a potential moral hazard problem in people demanding the Executive Scheme, whereby respondents would like to enroll when they suspect they will need health services. Where they self-assess to be fit or fairly fit, then they are not likely to enroll for the Executive Scheme. In case of unexpected illness, these would be the likely candidates for free government health facilities. The demand for the EconoPlan shares the same characteristics as that for the Executive scheme except that this time both Age and Age Squared were significant at 10% level and they had the a priori sign. Below the age restrictions, age is a motivating factor for this cheaper or minimum scheme.

Next, a binomial test was used to validate the descriptive statistics result that 98% of the sample visit a paying health facility and only 2% go to non-paying public health facilities With a probability parameter of 0.5, the test was used to analyse the extent to which formal sector employees prefer to get medical treatment from private health facilities where health insurance is relevant. The results showed that the observed asymptotic significance level, based on Z approximation, was very small (0.000). We therefore rejected the hypothesis that the proportion of each category is 0.5, at 1% level of significance and concluded that the proportions of the two categories were statistically different at 1% level. Based on this test, 98% of the respondents pay for their health services. We can therefore conclude that the majority of formal sector employees prefer to receive treatment from private health facilities. These are in fact the facilities where health insurance is relevant. The same test was also run on the 73 non-insured respondents to determine the major reason for not having a scheme with MASM. The results which were statistically significant at 1% indicate that 68% of the non-insured had no insurance due to lack of information, while 32% was due to lack of income. We can therefore conclude that lack of knowledge (68%) is the major reason why most formal sector employees do not have a scheme with MASM.

Limitations of the study: The major weakness of the study is that data were collected when MASM was the only health insurance provider in Malawi. Policy implications from the study may now be misleading as they could now be other important determinants brought about by the existence of competition in the health insurance industry.

CONCLUSIONS

The study has shown that formal sector employees in Malawi prefer to get medical care from private health facilities where user fees are levied and where health insurance is relevant. It has also shown that lack of information is the main reason why many employees do not have a scheme with MASM. The results of the multinomial logit regression have revealed that income is the major determinant of demand for all the three types of schemes with MASM. This finding is in support of the vast literature on determinants of health insurance, such as Finn and Halmon (2006), Liu and Chen (2002) and Kirigia *et al.* (2005). For the most expensive scheme, VIP, income and age are the most important variables and for the cheapest scheme, the Econoplan, income, age, number of children and different levels of self-reported health status all influence demand for the scheme. For the intermediate scheme, the determinants are the same as for the Econoplan, except for income. Therefore, policies that would enlighten formal sector employees in Malawi on health insurance procedures in general and the operation of MASM in particular, would increase demand for MASM schemes. Since income is the major determinant for any MASM scheme, as incomes of former sector employees rise, demand for MASM scheme is also likely to increase.

REFERENCES

Anonymous, 2000. SADC Regional Human Development Report, 2000. Harare: UNDP/SADC/SAPES, SAPES Books.

Anonymous, 2001. Malawi National Health Accounts (NHA): A Broader Perspective of the Malawian Health Sector, Lilongwe, Malawi Government.

Anonymous, 2003. World Development Report, Washington D.C., World Bank/Oxford University Press, World Bank.

Anonymous, 2006a. Malawi Poverty and Vulnerability Assessment: Investing in our Future, Draft Report. Malawi Government/World Bank.

Anonymous, 2006b. Country Health System Fact Sheet 2006: World Health Statistics, Malawi. Available at: http://www.afro.who.int/home/countries/fact_sheets/malawi.pdf

Christiansen, T.J., F. Lauridsen and F. Kamper-Jorgensen, 2002. Demand for private health insurance and demand for health care by privately and non-privately insured in Denmark. University of Southern Denmark, Health Economics Paper 2002:1. Available at http://www.sam.sdu.dk/healtheco/publications/20021.pdf

Costa-Font, J. and J. Garcia, 1999. Demand for private health insurance: Is there a quality gap? UPF Economics and Business Working Paper No. 531. Available at SSRN: http://ssrn.com/abstract=273418

Finn, C. and C. Halmon, 2006. A dynamic model of demand for private health insurance in ireland, IZA discussion Papers 2472, Institute for the study of labour (IZA). Available at http://ideas.repec.org/p/iza/izadps/dp2472.html

Kirigia, J.M., L.G. Sambo, B. Nganda, G.M. Mwabu, R. Chatora and T. Mwase, 2005. Determinants of health insurance ownership among South African women. BMC Health Services Res., 5: 17.

Liu, T.C. and C.S. Chen, 2002. An Analysis of Private Health Insurance Purchasing Decisions with National Health Insurance in Taiwan. Soc. Sci. Med., 55: 755-774.

Nyman, J.A., 1999. The value of health insurance: The access motive. J. Health Econ., 18: 141-145.

Scott Long, J., 1997. Regression Models for Categorical and Limited Dependent Variables. SAGE Publications, Inc., California.

Thomson, S., R. Busse and E. Mossialos, 2002. Low demand for substitutive voluntary health insurance in Germany. Croatian Med. J., 43: 425-32.

Von Neumann, J. and O. Morgenstern, 1944. Theory of Games and Economic Behaviour. Princeton University Press, Princeton, NJ.