CHAPTER ONE

INTRODUCTION

1.0 Overview

The health and medical care industry is a rapidly expanding sector in Asia. The Asia Pacific Management Forum's (APMF's) Asia Trends 2000 Review noted that the health care industry has grown quickly following high demand for quality medical and health care services[1].

The cultivation of expertise in the areas of health and social care requires collaboration in different areas of training and development, personal development and higher education.

In view of the importance of health and medical care, it would be beneficial to review the relationship between health care demand and other key factors.

The demand for medical care is in itself the outcome of consumer behavior and centered on variables such as relative prices. This study focuses on behavioral factors that govern the demand for medical care in Singapore and Malaysia.

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[1] Reference from "Medicine and Health Care Management: An Asia Pacific Management Forum Weekly Research Review (the week of 27th March to 2nd April 2000), *Journal of Management in Medicine / International Journal of Health Care Quality Assurance* by the Asia Pacific Management Forum". http://www.apmforum.com/emerald/medicine-health-management.htm

1.1 General Information on Medical Care in Singapore

Singapore is a small country with a total land area of 659.9 square kilometers. Since its independence in 1965, Singapore's health care service is comparable with that in developed countries. Although it is small, Singapore is still considered as one of the most advanced countries in Asia with "State-of-the-art" health care infrastructure and digital technology for all major industrial sectors[2].

Total population in Singapore was about 3.1 million in 1997, while the per capita government health care expenditure in that year was USD 300. In 1996, the per capita total health care expenditure consisting of both public and private health care was USD 745[3]. Total population was about 4.0 million in 1999 with 3.22 million indicated as resident population[4].

Singapore has a relatively young population; the number of Singaporeans aged 60 and above only comprises 11% of the whole population in 1991. This number is expected to rise from 245,000 in 1991 to 800,000 in 2020 and it is predicted to accelerate again by

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[2] Refer to "The Golden Triangle Organization, Incorporation: Medical Products Marketing in Singapore" http://www.goldentriangle.com/singapore2.html

[3] Refer to "Tradeport Health Care Services Report: Singapore's Health Care Services" http://www.tradeport.org/ts/countries/singapore/isar0018.html

[4] Refer to "Overview of the Singapore Health Care System (Ministry of Health)". http://app.moh.gov.sg/our/our01.asp

up to 27% by the year 2030[4]. The population in the median age will rise from 30 years in 1991 to 41 years in 2020[5].

The World Health Organization (WHO) ranked Singapore sixth out of 191 countries surveyed for its health care quality[6]. In other words, the state of health in Singapore has achieved international standards. The demand and cost of health care has risen rapidly and steadily over the past decade.

Singapore's health care facilities are reputed to be the best in Southeast Asia because health care in Singapore is backed up by a well-funded and comprehensive state system. Furthermore, health care in Singapore is also complemented by a sophisticated private sector, which provides 80% of primary health services and 20% of hospital services. The public sector provides 20% of primary health care and 80% of hospital care[7]. To improve the expertise of medical facilities, both government and private hospitals need to collaborate with reputable health care management companies, foreign hospitals and medical centers.

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[4] Refer to "Overview of the Singapore Health Care System (Ministry of Health)". http://app.moh.gov.sg/our/our01.asp

[5] Refer to "Medical Devices in Singapore". http://www.ita.doc.gov/td/mdequip/singapore980401.doc

[6] Refer to "The Golden Triangle Organization, Incorporation". http://www.goldentriangle.com/

[7] Refer to "Overview of the Singapore Health Care System (Ministry of Health)". http://app.moh.gov.sg/our/our01.asp

Medical instruments for Singapore market in 1998 are estimated at around USD 410 million. Imports from United States are estimated at USD 173 million (33% of the total imports of medical devices). With more detail, the increase in 1999 is predicted at 7.3% for the total market and 4.0% for imports from United States[8].

The Ministry of Health (MOH) plays a pivotal role in developing the health care services in Singapore. Here, Ministry of Health is responsible for providing preventive, curative and rehabilitative health services in Singapore[9].

Owing to the rise of the ageing populace, as well as medical costs, Singapore government provides guidelines to solve the above increasing burden. Subsequent to the government intention, the Ministry of Health has implemented several policies on health care financing, where one of the well-known policies is 'CASEMIX'. CASEMIX,[10] announced in November 1998, is a crucial instrument in monitor the subsidies and effectively managing the health care resources in an attempt to keep health care affordable.

Medical facilities in Singapore are well equipped by a dual system of health care delivery, which can be categorized according to the public system and private system.

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[8] Refer to "Medical Devices in Singapore".
http://www.ita.doc.gov/td/mdequip/singapore980401.doc
[9] Reference from the "Overview of the Singapore Health Care System" from Ministry of Health".
http://app.moh.gov.sg/our/our01.asp
[10] CASEMIX refers to the range and type of patients a hospital or health service treats.
Refer to "About Us: Organization Structure for Singapore's Casemix".
http://app.internet.gov.sg/scripts/moh/newmoh/asp/abo/abo020202010103.asp

The government controls the public system while the private hospitals and general practitioners manage the private system[11].

There were 23 hospitals in 1998, where the Ministry of Health operated 10 of them and the remaining 13 are operated by the private sector. The total number of beds was 11,276 in July 31, 1998 of which 9,091 were under the Ministry of Health and 2,185 with the private sector[12]. Nevertheless, the number of hospitals in 1996 was 26, which is 3 hospitals more than in year 1998; however, the number of beds was only 10,668. The amount of hospitals in 1997 was 24 with a total number of 10,380 beds.

The infant mortality rate was low in 1996 with 3.8 per 1,000 live births and life expectancy was an average 76.6 years. This rate has been reduced to 3.2 per 1,000 live births in 1999, and the average life expectancy rate has increased to 77.6 years[13].

The Singapore government spent USD 2.4 million or 2.7% of its GDP on health care in 1996. This amount is considered the highest in Asia with about USD 800 per capita spending for a 3.04 million population[14]. Whereas, the per capita total health care expenditures (public and private) were USD 745 or 3.0% of Gross Domestic Product

[11] Refer to "Overview of the Singapore Health Care System (Ministry of Health)". http://app.moh.gov.sg/our/our01.asp
[12] Refer to "Tradeport Health Care Services Report: Singapore's Health Care Services". http://www.tradeport.org/ts/countries/singapore/isar0018.html
[13] Refer to "Overview of the Singapore Health Care System (Ministry of Health)". http://app.moh.gov.sg/our/our01.asp
[14] Refer to "Medical Devices in Singapore". http://www.ita.doc.gov/td/mdequip/singapore980401.doc

(GDP). Nonetheless, government health care expenditure in 1997 was USD 1.196 billion or about USD 300 per capita. In 1998, Singapore government on the public health care services subsidized $1,089 million or 0.8% of Gross Domestic Product. About $4.3 billion or 3.0% of Gross Domestic Product was spend by the government on health care services with per capita health care spending of Singapore dollar 1,347 in 1999[15].

1.2 General Information on Medical Care in Malaysia

Malaysia is a country located in the equatorial region, which covers an area of 330,434 square kilometers. Peninsular Malaysia has an area of 131,598 square kilometers, while Sarawak and Sabah respectively covers 124,449 and 73,620 square kilometers[16].

Population in Malaysia is about 22.2 million. Malaysians are made up of Malays, Chinese, Indians and other indigenous people such as the Sea Dayaks (Ibans), Muruts and Bisayas (Lun Bawangs), Melanaus (known as Bumiputras), Eurasians and many others. The birth rate is 26.05 births/1,000 population and the mortality rate for Malaysian is 5.29 deaths/1,000 population, while, life expectancy at birth is an average 70.67 years in 1999[16].

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[15] Refer to "Overview of the Singapore Health Care System (Ministry of Health)". http://app.moh.gov.sg/our/our01.asp

[16] Information from "Malaysia: General Details". http://www.asiatradehub.com/malaysia/general.asp

The public and private sectors are two distinct markets. Over the past decade, Malaysia has experienced a revolutionary change from a primarily public health care system to privatization with a large number of private hospitals and clinics being established to provide advanced technologies and treatments[17]. Private practitioners and public clinics carry out primary health care in Malaysia with private sector provides 46% of primary health care services and the public sector provides 54% of primary health care services[18]. There are 221 private health care facilities in Malaysia and this includes hospitals, maternity homes and geriatric homes[18]. However, Malaysians are still largely dependent on heavily subsidized government hospitals and clinics since the healthcare services are concentrated in the public sector, with the Ministry of Health (MOH) providing the majority of secondary and territory care facilities[18].

The health care combined operating and development budget in 1997 amounted to RM3.45 billion (almost USD 1.2 billion), while health care "coverage[19]" was 95% of the Peninsular Malaysia population and 70% of the population in Sabah and Sarawak. Under this 1997 Budget, the government also maintained the relative hospital fees at a

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[17] Refer to "Malaysia Medical Equipment and Services: Medical Equipment and Supplies" and "Medical Products and Supplies Market".
http://134.197.60.142/cd/gto95/pdf/MEDICAL.PDF
http://www.salemsbdc.org/FMAs/Industry-analyses/Medical-products-supplies_market-analysis.htm

[18] Refer to "Health IT Market Brief: Healthcare in Malaysia".
http://www.chic.org.au/Documents/CHIC/InternationalBriefs/Malaysia_one-page.pdf

[19] In Malaysia, health care coverage is defined as the availability of health facilities within five miles. Information from "Malaysia Medical Equipment and Services: Medical Equipment and Supplies".
http://134.197.60.142/cd/gto95/pdf/MEDICAL.PDF

reasonable level to fulfill the government's intention to make Malaysia an international medical center[19].

Since the mid 1980s, independent facilities in Malaysia have begun to be linked to large health care groups in private sectors[20]. In 1996, about RM216 million (USD 54 million) was spent on medical equipment by the government[21]. However medical facilities and equipment in Malaysia is still inadequate at the present time, thus most medical equipment is imported from foreign countries particularly from developed countries. Nevertheless, the imported medical equipment is recently more expensive since economic crisis due to the depreciation in local currency.

Perhaps, owing to the increasingly health-conscious population, there is an increase in the demand for health care services to be upgraded. This can be seen from the 1997 Budget, which has allocated RM3.45 billion (almost USD 900 million) to upgrade the health level and quality services[22].

Since the government developed the Seventh Malaysia Plan (1996-2000), privatization and corporation has accelerated, where the government allocated RM1

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[19] Information from "Malaysia Medical Equipment and Services: Medical Equipment and Supplies". http://134.197.60.142/cd/gto95/pdf/MEDICAL.PDF

[20] Refer to "Health IT Market Brief: Healthcare in Malaysia". http://www.chic.org.au/Documents/CHIC/InternationalBriefs/Malaysia_one-page.pdf

[21] Information from "Malaysia Medical Equipment and Services: Medical Equipment and Supplies". http://134.197.60.142/cd/gto95/pdf/MEDICAL.PDF

[22] Refer to "Medical Products and Supplies Market". http://www.salemsbdc.org/FMAs/Industry-analyses/Medical-products-supplies_market-analysis.htm

billion for upgrading hospitals and medical facilities[22]. In 1997, a total of 23 new hospitals and 77 health clinics as well as health clinics in rural areas have been built and well equipped with up-to-date facilities and apparatus[22].

Until mid 1980s, about three-quarters of national health care services were provided by the public sector. Health care expenditures in 1989 were RM1.45 billion (USD 580 million), it increased rapidly to RM2.42 billion (USD 970 million) in 1994. This indicates that the average growth rate is about 10.7%[22].

The private sector also plans to increase new facilities. There are about 5,000 private hospitals in Malaysia. In the public sector, health equipment purchases can be categorized as purchases greater and less than RM50,000. For those purchases over RM50,000 (approximate USD 17,000) a tender will be issued by the Ministry of Health[22].

There are about 35,000 beds in the government hospitals; while in the private sector there are 8,000 hospitals and nursing care beds as well as 5,000 general and

[22] Refer to "Medical Products and Supplies Market".
http://www.salemsbde.org/FMAs/Industry-analyses/Medical-products-supplies_market-analysis.htm

specialist clinics. From the other aspect, the relative price forms a dominant component of medical purchase decision, however, it is not the overwhelming decision factor[22].

In order to overcome the deficiency of medical personnel, the government is relaxing its rules to invite foreign specialists to train junior doctors. Malaysian doctors working abroad are encouraged to come back to practice in Malaysia[22]. In addition, the government is also trying to increase the number of intake of students in universities and training colleges as well as the private medical colleges in Malaysia with the purpose of upgrading the skills of health personnel at all levels by using information as a management tool[23].

1.3 Objectives

The main objective is to examine the health capital model for Singapore and Malaysia. Cointegration and causality tests are conducted to establish the relationships between relevant series for both countries. The Johansen Cointegration Test is used to test the long run relationship, while the Granger Causality Test is used to test the short-term relationship.

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[22] Refer to "Medical Products and Supplies Market".
http://www.salemsbde.org/FMAs/Industry-analyses/Medical-products-supplies_market-analysis.htm
[23] Refer to "Malaysia: Population Statistics, Vital Statistics, Health Statistics and Computerization of Health Information".
http://www.seamic-imfj.or.jp/PDF/1998SHS/2-4.pdf

We aim to explain the demand for medical care in our health care model based on the net consumption expenditure and the relative price of medical care. The data series are tested using Augmented Dickey Fuller (ADF) Test and Phillips-Perron (PP) Test.

We will attempt to create a better understanding of the roles played by the explanatory variables (net consumption expenditure and relative price of medical care) in previous models (e.g.: Lee and Kong, 1999) of the demand for medical care.

Finally, we attempt to demonstrate that net consumption expenditure and the relative price of medical care are the key long-run determinants of macroeconomic demand for medical care.

1.4 Outline of Study

This paper will be divided into 6 sections. Section 1 is the introduction; section 2 reviews the literature. Section 3 is the theory of health and medical care. Section 4 is about the data collection and methodology descriptions where we will present a simplified generalized version of Grossman Model of the demand for medical care and derive the cointegration restriction. The validity of the cointegration restriction is tested against the data for Singapore and Malaysia cases. The preference parameters in the utility function will be examined and the prediction of the model for both countries will also be investigated in this section. Section 5 is the empirical results and discussion, while section 6 is the conclusion.