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A COMPARATIVE ANALYSIS OF PRODUCTIVITY AND EFFICIENCY OF LIFE INSURANCE COMPANIES IN MALAYSIA AND SINGAPORE: 1999-2007

BY

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ABSTRACT

This research seeks to answer the main question as to whether life insurance companies in Singapore, being a more developed and open economy, are more efficient than those of Malaysia, which has a bigger market. Previous research in other countries has found that less regulation and a more open economy does not necessarily lead to greater efficiencies. Despite the plethora of efficiency studies using frontier techniques on various industries in various countries, there is however a dearth of efficiency studies on insurance companies, particularly life insurance, in Malaysia and Singapore. To bridge this gap, we estimate the efficiency of 16 life insurance companies in Malaysia and 10 in Singapore over a nine year period (1999-2007) using data envelopment analysis and stochastic frontier analysis. Using the two techniques enables us to investigate the consistency of the results. Data are obtained from insurance returns of Bank Negara Malaysia and the Monetary Authority of Singapore. Adjustments are made for inflation and exchange rates using IMF sources. Insurance premium and investment income are used as outputs, while management expenses and distribution expenses are used as inputs. Technical efficiency scores for each life insurance company for each year are then estimated. The effects of environmental factors on efficiency and productivity changes over time for the insurances companies are also studied. We find that life insurance companies in Singapore are more efficient than those in Malaysia. However, the differences in growth of productivity of the companies in the two countries are not significant. Large companies are found to contribute towards technical efficiency, while mixed results are found for the other environmental factors.

خلاصة البحث

يسعى هذا البحث إلى الإجابة عن التساؤل الرئيس الآتي: هل شركات التأمين على الحياة في سنغافورة، التي تعدُّ بلداً أكثر تطوراً وانفتاحاً في الجانب الاقتصادي من ماليزيا، أكثر كفاءة من شركات التأمين على الحياة في ماليزيا، والتي تمتلك سوقاً أكبر من سوق سنغافورة؟ أثبتت البحوث السابقة في الدول الأخرى أن وجود قوانين وتشريعات أقل أو وجود انفتاح اقتصادي أكبر لا يؤدي بالضروة إلى الوصول إلى كفاءة أكبر. وبالرغم من وفرة الدراسات التي استخدمت أحدث التقنيات في موضوع الكفاءة في الصناعات المختلفة وفي مختلف البلاد، إلا أن هناك نقصاً في دراسات موضوع الكفاءة في مجال شركات التأمين، لا سيّما شركات التأمين على الحياة في ماليزيا وسنغافورة. تمت دراسة الكفاءة في (16) شركة في ماليزيا و(10) شركات في سنغافورة خلال فترة امتدت تسع سنين (1999-2007) باستخدام طريقة تحليل مغلف البيانات، وتحليل الحدود العشوائية؛ من أجل سد النقص والفراغ في الأبحاث في هذا المجال، وبدون أدنى شك فإن استخدام هاتين الطريقتين؛ نتج عنه الوصول إلى الاتساق والانسجام في نتائج البحث.تم الحصول على بيانات عائدات التأمين في كلٍ من مصرف نيجارا في ماليزيا، وسلطة النقد السنغافورية. كما جرى تعديل معدل التضحم وأسعار صرف العملة باستخدام مصادر صندوق النقد الدّولي. كذلك استخدمت أقساط التأمين وعائدات الاستثمار مخرجات، بينما استخدمت نفقات الإدارة ومصاريف التوزيع مدخلات. بالإضافة إلى أنه تم حساب نتائج الكفاءة الفنية لكل شركة من شركات تأمين على الحياة في كل سنة، وكذلك دراسة التغييرات الحاصلة على تأثير عوامل البيئة في الكفاءة والإنتاجية لشركات التأمين. خلص البحث إلى أن شركات التامين في سنغافورة أكثر كفاءة من مثيلاتها في ماليزيا، وأن الفرق في زيادة الإنتاجية لهذه الشركات في هذين البلدين ليس فرقاً ذا أهمية تذكر، علاوة على أن الشركات الكبيرة تسعى إلى الوصول إلى الكفاءة الفنية، بينما كانت النتائج فيما يتعلق بالعوامل البيئية الأخرى متباينة.

APPROVAL PAGE

The thesis of Baharin bin Salleh has been examined and approved by the following:

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DECLARATION

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degree at IIUM or other institutions.

Baharin bin Salleh

Signature …………………………………… Date ……………………..

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Signature Date

This thesis is dedicated to Amira, Arina, Reza and,

especially, my friend of 40 years, Ruby.

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LIST OF ABBREVIATIONS

AIAM	American International Assurance Bhd, Malaysia
AIAS	American International Assurance Company Ltd, Singapore
ALLM	Allianz Life Insurance Malaysia Bhd, Malaysia
AMAM	AmAssurance Bhd, Malaysia
ASEAN	Association of South East Asian Nations
AVIS	Aviva Ltd, Singapore
AXAM	Axa Affin Life Insurance Bhd, Malaysia
BNM	Bank Negara Malaysia
CIMM	CIMB Aviva Assurance Bhd, Malaysia
CRS	constant returns to scale
DEA	data envelopment analysis
EFFCH	technical efficiency change
ETIM	Etiqa Insurance Bhd, Malaysia
exp	exponential, *e*
GELM	Great Eastern Life Assurance (Malaysia) Bhd, Malaysia
GELS	The Great Eastern Life Assurance Company Ltd, Singapore
GNP	gross national product
HLAM	Hong Leong Assurance Bhd, Malaysia
HSBS	HSBC Insurance (Singapore) Pte Ltd, Singapore
iid	independent and identically distributed
IMF	International Monetary Fund
INGM	ING Insurance Bhd, Malaysia
MAAM	Malaysia Assurance Alliance Bhd, Malaysia
MANM	Manulife Insurance (Malaysia) Bhd, Malaysia
MANS	Manulife (Singapore) Pte Ltd, Singapore
MAS	Monetary Authority of Singapore
MAYM	Mayban Life Assurance Bhd, Malaysia
MCZM	MCIS Zurich Insurance Bhd, Malaysia
NIRS	non-increasing returns to scale
NTUS	NTUC Income Insurance Co-Operative Ltd, Singapore
OACS	Overseas Association Corporation Ltd, Singapore
OECD	Organisation for Economic Cooperation and Development

OLS	ordinary least squares
PECH	pure technical efficiency change
PRUM	Prudential Assurance Malaysia Bhd, Malaysia
PRUS	Prudential Asssurance Company (Pte) Ltd, Singapore
SECH	scale efficiency change
SFA	stochastic frontier analysis
TE	technical efficiency
TECCH	technological change
TFP	total factor productivity
TFPCH	total factor productivity change
TMAM	TM Asia Life Bhd, Malaysia
TMAS	TM Asia Life Singapore Ltd, Singapore
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
UNIM	Uni.Asia Life Assurance Bhd, Malaysia
UOBS	United Overseas Insurance Ltd, Singapore
US	United States of America
USA	United States of America
VRS	variable returns to scale

CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

This dissertation is about technical efficiency of life insurance companies in two neighbouring countries in Asia, i.e., Malaysia and Singapore. By technical efficiency of a firm we mean the ability of the firm to produce maximum outputs with a given level of inputs or to produce a given level of outputs using the minimum level of inputs. The concept of efficiency will be covered in greater detail in Chapter 3. Frontier techniques will be used to estimate the efficiency measures.

This introductory chapter, which provides the backdrop to the study, is organized as follows. Following immediately is a section that discusses the motivation for the study. Thereafter, the history of the two countries and its implication on the make-up of the insurance industry are presented. This historical background helps us to appreciate how the two countries – which were originally one country -- have evolved over the years. Some statistical information on the life insurance industry in Malaysia and Singapore and a short description on the concept of economic openness are also given. The rest of the chapter covers topics related to the fundamental basis of the research, i.e., research questions, objectives, the significance and limitations of the research.

1.2 MOTIVATION FOR THE STUDY

Studies on efficiency using frontier techniques have been carried out on a wide variety of industries but they are concentrated in the developed economies of USA and

Europe. The majority of these studies have been done on the banking industry (e.g., Altunbas, Evans and Molyneux, 2001; Orea, 2002; Pastor, Lovell and Tulkens, 2006; Resti, 1997). This is not surprising considering the importance of the financial sector to the economy (World Bank, 1989; Roubini and Sala-i-Martin, 1992; and King and Levine, 1993). Other efficiency studies using frontier techniques include those on the power industry (Greene, 1990; Hattori, 2002), on hospitals (Rosko, Proenca, Zinn and Bazzoli, 2007; Jacobs, 2001), on fishery (Del Hoyo, Espino and Toribio, 2004), on farms (Latruffe, Balcombe, Davidora and Zawalinska, 2004; Kebede, 2001) and on manufacturing (Diaz and Sanchez, 2007). On the insurance industry, Eling and Luhnen (2008) provide a wide-ranging survey of over 87 papers related to efficiency and analyse 3,555 life and non-life insurance companies from 34 countries. In a subsequent paper, Eling and Luhnen (2010) updated their data, and made an efficiency analysis of 6,771 life and non-life insurance companies from 92 countries, including life and non-life insurance companies of Malaysia and Singapore.

Despite the plethora of efficiency studies using frontier techniques on various industries in various countries, there is a dearth of studies on life insurance industry in Malaysia and Singapore. Although both Eling and Luhnen's studies produce efficiency scores of *non-life* companies for Malaysia and Singapore, they are not able to estimate the efficiency scores for the *life* insurance companies for these two countries. Other than these studies, as far as we are aware, there have only been two efficiency studies done on life insurance companies in Malaysia—by Mansor and Radam (2000) and by Saad, Majid, Yusof, Duasa and Rahman (2006)-- and none in Singapore. This gap in knowledge on the insurance industry in the two countries provides the primary motivation for this dissertation.

The second motivating factor for this study is the desire to make a contribution to the study of the life insurance industry which is an essential component of the financial sector. A well-developed financial sector is important as it can contribute to growth of the economy. The positive role of financial markets in economic growth is supported by theories (e.g., Schumpeter, 1959; McKinnon, 1973; Shaw, 1973) and empirical studies (e.g., Greenwood and Jovanovic, 1990; Bencivenga and Smith, 1991). However, the majority of the work on the effect of the financial sector on economic growth has been mostly done on the banking sector and the stock market (Levine, 2005). An empirical work on the contribution of the insurance sector to growth is that of Arena (2008) who finds evidence for the sector's contribution to growth in developing as well as in developed economies. Skipper (1997) gives seven ways as to how the insurance industry contributes to economic development and how the presence of foreign insurers would help towards this end. Indeed, insurance is so important for trade and development of a country that, at its first session in 1964, the United Nations Conference on Trade and Development formally stated that "a sound national insurance and reinsurance market is an essential characteristic of economic growth" (UNCTAD, 1964: 55). By focusing on life insurance, rather than studying the whole insurance industry which is made up of life and non-life insurance businesses, we are able to focus on this segment of the insurance industry, and not confound the effects with the non-life insurance business.

The third and final motivating factor for our study is to have the benefit of benchmarking. It is a fact that Malaysia and Singapore have a common historical background starting from the early days of the British Empire. However, since independence, Singapore has pursued a more open economy, compared to Malaysia. Singapore's GNP per capita is now comparable to the developed economies of the world while Malaysia's has remained at a more modest level. While empirical studies in different countries have not been conclusive on the effect of an open economy on the efficiency of their financial institutions, knowing whether there are significant differences in the efficiency of the life insurance industry in the two countries can provide valuable lessons in this area.

1.3 BACKGROUND OF THE INSURANCE INDUSTRY

1.3.1 History

The insurance industry in Malaysia and Singapore share the same origin in history. Both countries were under the influence of Great Britain since the eighteenth century when European powers went to the four corners of the world to seek fame and fortune. Insurance in this region developed from international trade associated with the trading houses that were set up to handle the commerce in the area. These trading houses became agencies and later brokers and branches of insurance companies of the home country.

The island of Singapore is located at the tip of the Malay Peninsula. It is physically joined to West Malaysia by a 1 km causeway (since 1924) and a bridge (since 1978) across the Straits of Johor. Historically, Singapore was part of the Johor sultanate until 1819 when the British, under Sir Stamford Raffles, replaced the then Sultan of Johor with his exiled brother. In return the British were granted by the new Sultan the right to establish a trading post on the island. In 1823, a new treaty was signed between the Sultan and the British whereby the island was brought under British law (Wikipedia, 2009).

The involvement of the British in the politics and trade of the region since the eighteenth century provided the seed for the insurance industry to grow. Apart from

Singapore, the other trading centres in the region at the time were Penang and Melaka which were acquired by the British East India Company in 1786 and 1825 respectively (Lee, 1997). With the advanced weaponry of the British at the time, the local rulers appointed the British as "Residents" to help keep their enemies at bay and act as advisers.

Trade developed when the British exported the produce of the region, which were mainly tin, rubber and other commodities, back to Britain. Penang, Melaka, and especially Singapore by virtue of its favourable geographical location, developed into major trading centres for the hinterland. Companies from the UK opened trading houses in these commercial centres, at first handling exports of commodities from the region and the import of manufactured products from Britain. With the increase of trade and commerce, and the consequent increased need for insurance in the export and import business, the trading houses also became agents for the insurance companies.

The first insurance company to provide underwriting facilities in Singapore was The Alliance British and Foreign Life & Fire Insurance Company of London in 1827, just eight years after the arrival of Stamford Raffles in Singapore (Kohli, 1982). Later in the year, Alliance appointed the firm of Napier & Scott as their agents in Singapore. The Royal Insurance Company appointed Boustead in 1846, and other insurance companies from Australia, China, India and Hong Kong followed suit.

The development of the insurance business in Malaysia (then Malaya) has been in line with that of Singapore. Insurance companies, especially those from Britain, also appointed their agents for Malaya. Other well-known agents of UK origin which are household names until today are companies such as Sime Darby, Guthries and Harrison and Crosfield.

Malaya became independent of British rule in 1957. Since independence, Malaya and Singapore have taken different paths to economic growth. Malaya, and later Malaysia, being rich in natural resources and having a much bigger and more diversified population, resorted to a less open economy relative to Singapore, which has adopted an open economic system. Today Singapore has developed into a city state specializing in trade and services and is now a major financial centre in Asia. Indeed, with a gross domestic product (GDP) per capita of US$46,044 in 2008, Singapore has been classified by the International Monetary Fund as an advanced economy, along with the G7 countries and 10 other countries in Europe (IMF, 2010). This compares with Malaysia's GDP per capita of US$10,071 for the same year.

In 1963, Malaya, Singapore, Sarawak and British North Borneo formed Malaysia. Two years later, Singapore left Malaysia. In 1970, the new economic policy came into effect in Malaysia. This has had a profound effect on the economy of Malaysia, whereby there are rules on equity ownership of businesses and the employment in and management of all types of businesses in the country. Singapore, on the other hand, having left Malaysia, continued to develop its economy more openly than Malaysia.

Until 1963, Malaysia had no comprehensive legislation for the regulation of insurance business (Soe, 1979). Before the Insurance Act, 1963 was enacted, law on insurance was drawn from legislation enacted in the United Kingdom and "stop-gap" legislation specifically for certain insurance businesses. Thus we have the Life Assurance Companies (Amendment) Act, 1961; the Life Assurance Act, 1961 and the Life Assurance Companies (Compulsory Liquidation) Act, 1962. The main purpose of the Acts was to control the growth of "mushroom" insurance companies. It was also meant to stop gamblers and speculators from taking out life policies on other persons' lives in the hope of collecting the payout (Soe, 1979). Today, the insurance industry in Malaysia is regulated by the Insurance Act 1996 (which replaced the Insurance Act, 1963) and supervised by Bank Negara Malaysia. In Singapore the equivalent law is the Insurance Act (Chapter 142) and the supervisory authority is the Monetary Authority of Singapore. A good summary of the regulations in both countries is found in OECD (1999) and Milo (2003).

1.3.2 Current Status

Key indicators of insurance consumption of a country include insurance density and insurance penetration. These are defined below:

$$\text{Insurance density} = \text{Insurance premiums/Capita} \tag{1.1}$$

$$\text{Insurance penetration} = \text{Insurance premiums/GDP} \tag{1.2}$$

Insurance density shows the current status of insurance spending by the population of the country. A high insurance density shows that there is less room for the insurance industry to grow. Insurance penetration indicates the importance of insurance spending relative to the GDP of the economy. A low insurance penetration may be seen as an indicator of growth potential for a developing country, but it may indicate a slowing down of the growth rate for a developed economy (Enz, 2000).

Figure 1.1 gives a graphical representation for the year 2000 of insurance density and insurance penetration for the markets in Asia and fully developed markets of USA and Japan.

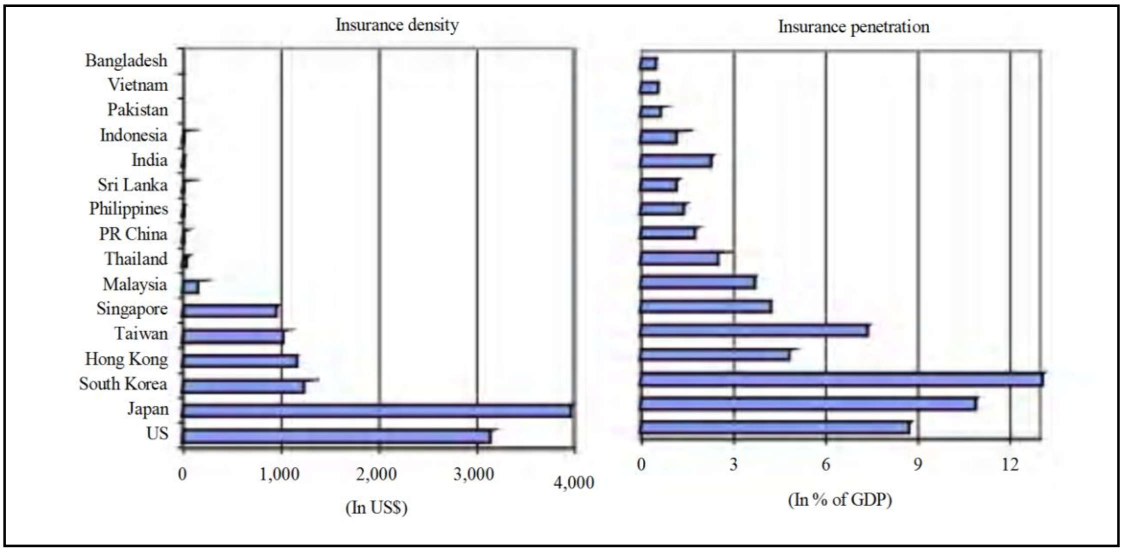

Figure 1.1: Insurance Density and Penetration in Selected Countries 2000
Source: Milo (2003)

It can be seen that Malaysia, with an insurance density of US$150 per capita, lagged behind Singapore whose insurance density was US$1,000 per capita. However, in terms of insurance penetration Malaysia's 4.0 percent is not too far behind the 4.5 percent of Singapore. It is interesting to note that USA and Japan, being the largest two insurance markets of the world, are way ahead of Malaysia and Singapore on both counts. It should also be noted that the other developing countries of Asia were very far behind Malaysia and Singapore.

Table 1.1 shows statistics of the two countries for the period 1999 until 2007 to give an indication of the relative size of the respective insurance markets and of the industry.