



Financial distress and the Malaysian dual banking system: A dynamic slacks approach



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ABSTRACT

This paper presents an efficiency assessment of the Malaysian dual banking system using the Dynamic Slacks Based Model (DSBM) in order to assess the evolution of Malaysian Banks' potential input–saving/output–increase from 2009 to 2013. More precisely, DSBM is used first in a two-stage approach to assess the relative efficiency of Malaysian Islamic and conventional banks by emulating the CAMEL rating systems. Then, in the second stage, Monte Carlo Markov Chain (MCMC) methods applied to generalized linear mixed models (GLMM) are combined with DSBM results as part of an attempt to produce a model for banking performance assessment with effective predictive ability. Results indicate higher inefficiency levels and slacks in Islamic banks when compared to conventional ones. Furthermore, when the scope of analysis is the group of Malaysian Islamic banks, the efficiency levels of foreign banks are lower compared to their national counterparts, suggesting regulatory and cultural barriers. Policy implications are derived.

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1. Introduction

Since the inception of efficiency measurement tools in banking, most studies have focused on developed economies, see, for instance, Matousek et al. (2015) and the reference therein. Paradi et al. (2011) listed the top ten countries targeted by researchers worldwide: all of them were developed economies except for India, which has been receiving increasing attention (Fujii et al., 2014). Additionally, and more specifically, Sufian et al. (2014) reported that only a limited number of papers have focused on Islamic banking, particularly in emerging economies such as Malaysia. In an earlier paper, Sufian et al. (2008) examined the performance of Islamic banks in the Middle East and North Africa (MENA), and in Asian countries. Although, their results revealed administrative

inefficiencies in resource management among the banks, a deeper analysis of the Malaysian dual banking system is yet lacking.

This paper aims to fill this gap, by analyzing the efficiency of the Malaysian dual banking system with the DSBM developed by Tone and Tsutsui (2010). Differently from previous DEA (Data Envelopment Analysis) models, the DSBM uses a non-radial slack-based measure, which allows a non-proportional change of inputs and outputs. Moreover, the DSBM defines inter-temporal activities as carry-overs and allows their categorization into four types: desirable, undesirable, discretionary, and non-discretionary. These features can be particularly useful when analyzing credit risk and financial distress within the ambit of banking efficiency, as the limits of capital and equity of each institution typically vary over the course of time in different proportions and do not follow fixed limits imposed by radial measures (Wanke et al., 2015; Banker et al., 1984; Varian, 1987).

Therefore, this paper is innovative in the context not only by focusing on the Malaysian dual banking system, but also by adopting DSBM combined with General Linear Mixed Models–Monte Carlo–Markov Chain (GLMM–MCMC) method in a two-stage approach. Motivations for the present research are discussed as

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follows, both in terms of methodological and theoretical aspects. First of all, dynamic slacks models in efficiency measurement may be particularly useful to unveil the evolution of financial distress of banks over the course of time, allowing the identification of key financial inputs and outputs that are related to banking performance. On the other hand, however, the use of GLMM-MCMC may be helpful in adequately measuring the impact of contextual variables on efficiency scores, since it is possible to control for random effects, such as the common financial ratios (e.g. ROI, ROA) that may vary within the same bank type and/or origin. Second, the study adds to the existing literature particularly in regards to its practical application which emulates the CAMELS rating systems (as proposed by Wanke et al., 2015) and interprets its results linked to corporate governance characteristics (Männasoo and Mayes, 2009). As a matter of fact, the CAMELS variables are reinterpreted as inputs and outputs for the DSBM, enabling a discussion upon of which financial accounts in the balance sheet are the most relevant to apprehend good or bad banking performance over the course of time. Third, we analyze the aggregate carry-over slacks during a period of time, regressing them against different contextual variables that characterize the dual banking system in Malaysia. This is a significant contribution to the current research on efficiency in the overall bank sector. Fourth, the paper expands the existing literature with respect to the use of MCMC general linear models to predict and interpret the role of major contextual variables in the achievement of higher efficiency levels in the Malaysian dual banking system. Moreover, this segmentation is per se a contribution to the current research field on banking in terms of policy design. Fifth, our analysis covers the period from 2009 to 2013; finally, it is based on a representative sample of the Malaysian dual banking system.

The results presented here constitute a contribution to the increasing literature on Islamic banking, mainly by shedding some light on the ways through which compliance with Shari'aa principles may affect financial performance. These results also expand the set of conclusions provided in recent previous studies, adding up to the body of knowledge. For example, Basov and Bharti (2014) found beneficial impacts derived from the Shari'aa-compliant limits on the set of admissible investments. Similar results were noticed by Khediri et al. (2015). These authors showed that Islamic banks are, on average, more profitable, more liquid, better capitalized, and have lower credit risk. On the other hand, Dewandaru et al. (2015) found that equal returns can be obtained with lower risks for Islamic indices.

The research content is organized as follows: Section 2 covers the literature review on financial distress, also encompassing a discussion on the Malaysian dual banking system; Section 3 contains the data and the model; Section 4 presents the empirical results, and a discussion on policy implications; while conclusions follow in Section 5.

2. Literature review

Banks play a very important role in society and have a pivotal position in the process of promoting economic growth. As a result, bank performance evaluations have received much attention over the past several years, both for theoretical and practical purposes. These studies are often grouped into two main approaches: parametric and nonparametric (Berger and Humphrey, 1997; De Borger et al., 1998; Brandouy et al., 2010; Brissimis et al., 2010; Kerstens et al., 2011; Briec and Liang, 2011; Lampe and Hilgers, 2014). The most popular parametric method is known as the stochastic frontier approach (SFA), as the nonparametric one is DEA.

Since these efficiency measurement techniques report efficiency scores, it is fundamental to establish the linkages between financial (in)efficiency or inferior/superior performance and

financial distress. More precisely, these techniques should indicate how effective a financial institution is in minimizing variables related to financial distress and maximizing the ones related to financial health. In DEA, this fine-tuning between efficiency scores and decision-making is often accomplished not only by choosing the proper input and output variables set, but also by looking at their slacks.

A number of variables are thought to be associated with financial distress. Predicting failure using firm-specific characteristics together with financial structures is originally attributed to the seminal works of Altman (1968) and Altman et al. (1977), which employed discriminant analysis of financial ratios to derive the Z-score approach. More recently, Männasoo and Mayes (2009) presented a comprehensive literature review on this subject. According to these authors, although no universal set of indicators had been used across previous studies, the CAMELS factors appear to have a significant capacity to detect distress.

CAMELS is an acronym that stands for capital adequacy (C), asset quality (A), management efficiency (M), earnings (E), liquidity (L) and sensitivity to market risk (S). In recent decades, several studies reported on the use of such related-variables in risk measurement and monitoring. Examples can be found in Cole and Gunther (1995a,b), DeYoung (1998), Oshinsky and Olin (2006), Kumar and Ravi (2007), Poghosyan and Cihák (2011), and Ravisankar et al. (2010). More recently, Wanke et al. (2015) presented a practical application that emulated the CAMELS rating systems in the Brazilian banking industry using DSBM. The fundamental ideas behind this practical application are embedded in the close relationship between efficiency levels and input-reducing/output-increasing potentials: the latter may be considered as proxies for looming financial distress. In other words, consistent augments in the input-reducing/output-increasing potentials over time may constitute a leading distress indicator.

However, it should be noticed that, since the original criteria used to determine the CAMELS ratings are not disclosed to the general public (Jin et al., 2011), proxies are often selected accordingly, based both on prior studies and data availability. In Table 1 we list the major literature sub-criteria used to emulate the CAMELS rating system in different applications.

This scenario sets the stage for the main proposition of this study: efficiency levels in the Malaysian dual banking system are significantly affected by contextual variables related to the bank type (i.e., Islamic vs. conventional, and foreign vs. national). For instance, conventional banking processes in the finance sector are well known for leveraging banks' financial and operational indicators. The same basic economic principles apply to smaller national banks, which are the first to suffer the consequences of systemic financial crises. On the other hand, Islamic banking may be accountable for differences in technology production and managerial style, thus affecting efficiency levels. These issues are further explored hereafter.

2.1. On the Malaysian dual banking system and its underlying financial distress/stability

When seen from a global perspective, the growth of Islamic finance is striking. Since the inauguration of the first Islamic bank in 1975 in Dubai, Islamic finance has witnessed double-digit annual growth (Zivulovic, 2014). UKIFS (2013) reported that total Islamic financial assets will attain USD 2 trillion by year-end 2014 and, notably, 80% of these assets belong to the banking channel (EY, 2013). In this context, it becomes important to understand the role of Malaysia and its unique dual banking system experience

Malaysia has historically imposed strong supervision on its banking industry (Cook, 2008). Nowadays, the country's banking industry has 70 percent of the economy under direct supervision

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