First financial restructuring and operating efficiency: Evidence from Taiwanese commercial banks

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ABSTRACT

This paper investigates the effect of the "First Financial Restructuring" (FFR) on the operating efficiency of commercial banks in Taiwan. Applying data envelopment analysis (DEA) to operations data for 40 commercial banks over the 6-year period 2000–2005, we find that while the banks have lower operating efficiency on average during the reform period (2002–2003) compared to the pre-reform period (2000–2001), improved operating efficiency is reflected in the post-reform period (2004–2005). Our results remain unchanged even after controlling for the non-performing loan ratio, capital adequacy ratio, bank ownership, size, and GDP growth rate. These results suggest that the improved efficiency in the post-reform period is possibly due to enhanced banking and risk management practices and benefits obtained from compliance with the FFR.

1. Introduction

Over the past two decades, the globalization of financial markets and institutions has created an international and increasingly competitive banking environment. In such an environment, bank efficiency has become critically important (Harker and Zenios, 2000; Isik and Hassan, 2002). Banks must operate more efficiently, minimize costs, pursue potential scale efficiencies, develop and adopt technological innovations, and provide new products and services to meet these competitive challenges. Thus, a priori a more competitive environment should promote efficiency in the allocation of resources and provision of financial services. Consistent with this notion, some evidence suggests that increased competition can stimulate economic growth by raising the availability of credit and financial services to businesses and households (see Vives (2001) for a review).

In this increasingly competitive environment, the banking systems of many developing economies, however, have exhibited poor performance, perhaps due, in part, to excessive government regulations. To address this problem, various financial liberalizations, reforms and restructuring programs have been implemented in

an effort to foster banking efficiency (Denizer et al., 2007; Isik and Hassan, 2003; Zhao et al., 2010). These regulatory reforms were expected to lead to enhanced performance in banking, better resource allocation, stimulation of innovations, increased profitability and funds intermediated, improved prices and service quality for consumers, and greater soundness in the financial system.

The impact of such regulatory measures on bank efficiency has been widely studied with approximately 95% of this research focusing on banks of industrialized countries, especially the US (e.g., Berger and Mester, 2003; Pastor, 2002; Sturm and Williams, 2004). However, only a limited number of these studies have examined the impact of deregulation programs on developing economies (e.g., Berger and Humphrey, 1997; Canhoto and Dermine, 2003; Kwan, 2003; Fries and Taci, 2005; Williams and Nguyen, 2005).[1] Yet analyzing the deregulation experience of developing economies separately is important given their unique institutional structures (e.g., Sarkar and Bhaumik, 1998; Denizer, 1997). In addition, although the primary goal of deregulation has been to improve efficiency, the effects of these regulatory efforts have been mixed (e.g., Kumbhakar and Sarkar, 2003; Yildirim and Philippatos, 2007). Indeed, in some cases, deregulation appears to have led to a reduction in measured productivity rather than an improvement, raising

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[1] See Berger (2004) for a detailed review of international comparison of banking efficiency studies.

doubts about the conventional wisdom that deregulation always improves performance.

The current study addresses the scant research on developing economies by examining whether a Taiwanese government regulatory banking reform – the so-called "First Financial Restructuring" (FFR hereafter) – accomplished its mission to improve the operating efficiency of the banking sector. Banking in Taiwan has been a highly regulated industry, commensurate with its importance in the financial system. In addition, Taiwanese banking has been severely impacted by various political and environmental factors including threats from the military exercises of Mainland China conducted in 1995; the East Asian financial crisis beginning in Thailand in 1997; and local financial scandal tornados from massive non-performing loans in 1998. In an effort to avert a possible financial crisis and to establish a sound banking system, the regulatory authorities issued various reforms, regulations, and restructuring programs, including the FFR.[2] This reform required the non-performing loan ratio[3] of financial institutions to be below 5% and the capital adequacy ratio[4] to be at least 8% by 2003 (i.e., within 2 years of the regulation being passed by Congress in 2002). Non-performing loan and capital adequacy ratio regulations encourage bank managers to adopt better banking and risk management practices and to avoid regulatory costs that are imposed when the bank's ratios do not align with regulatory requirements. Prior research has emphasized the importance of these ratios to accounting and regulatory consequences (e.g., Anandarajan et al., 2005; Moyer, 1990) and documented their relation to efficiency (e.g., Halkos and Salamouris, 2004; Das and Ghosh, 2006).

We use data envelopment analysis (DEA) to analyze the extent of change in operating efficiency in the Taiwanese banking sector following FFR. We examine banking data for the 6-year period 2000–2005 for a sample of 40 commercial banks in Taiwan. Our results indicate that banks have lower operating efficiency during the FFR reform period (2002–2003) compared to the pre-reform period (2000–2001), but have higher operating efficiency in the post-reform period (2004–2005). Our results remain unchanged even after controlling for the non-performing loan ratio, capital adequacy ratio, banker ownership, size and GDP (gross domestic product) growth rate. Further, consistent with prior research (e.g., Berger and DeYoung, 1997; Das and Ghosh, 2006), our results indicate that banks with a higher non-performing loan ratio have lower operating efficiency while banks with a higher capital adequacy ratio have higher operating efficiency. Overall, our results indicate that the improved efficiency in the post-reform period is possibly due to enhanced banking and risk management practices and benefits obtained from compliance with the FFR including lower non-performing loan ratios, higher capital adequacy ratios, entry deregulation, branch de-licensing, and deregulation of interest rates.

Our study contributes to the literature in at least three ways. First, our primary contribution is assessing the impact of a public policy – namely, the FFR – on operating efficiency. The ability of banks to allocate funds as efficiently as possible to finance productive investment and consumption expenditures is crucial in producing a high and sustainable rate of economic growth. Evaluating how the FFR affects efficiency will provide insight for

bank management seeking to improve operating performance and policymakers considering financial reforms. In addition, as we discuss later in Section 2.1, prior research provides mixed results on the impact of restructuring reforms on efficiency. Given the apparent context specific nature of the reform–efficiency relation, we believe that it is especially important to empirically document the association between the FFR and bank operating efficiency in Taiwan. Second, our study provides additional empirical evidence on the impact of reforms on bank efficiency outside the United States. While financial reform and liberalization policies may be effective for developed economies, such policies may not bring optimal outcomes for developing countries where markets and institutional structures are different from those of developed countries. Therefore, it is important to examine the effects of government regulations on bank efficiency in developing countries (Isik and Hassan, 2003). Third, the current study provides evidence of the impact of the FFR reform on operating efficiency from the pre-reform period (2000–2001) to the reform period (2002–2003) and from the reform period (2002–2003) to the post-reform period (2004–2005). While prior research has indicated the importance of evaluating the periods both before and after deregulation to determine its effects on bank performance (Berger and Humphrey, 1997; Harker and Zenios, 2000), most prior studies investigate the efficiency after or during the reform period without covering the period before the reforms (Denizer et al., 2007). In the current study, however, we extend our sample period to before, during and after the FFR reform. Recall that the FFR was passed in 2002 and required compliance with its non-performing loan ratio and capital adequacy ratio mandates by the end of 2003. Thus, the FFR provides a naturally occurring three-part sample period – pre-, post- and during the FFR reform – in which to separately examine the efficiency effects resulting from *implementing* the requirements of the FFR and then *maintaining* these requirements after the implementation period. We expect and find that efficiency suffers during the implementation period due to the transition and adjustment costs associated with complying with the FFR requirements, and that efficiency improves after the implementation period due to continuing the enhanced banking practices and risk management practices employed to achieve these requirements. Without examining the efficiency effects in these three separate sample periods, the real impact of the FFR reform would likely be obscured.

The remainder of this paper is organized as follows. In Section 2, we briefly review studies related to financial reforms of banking and discuss the impact of non-performing loans and capital adequacy on operating efficiency to motivate our research hypotheses. In Section 3, we describe our research methodology including data and sample as well as the DEA model used to estimate bank operating efficiency. In Section 4, we present and discuss our empirical results as well as the sensitivity analysis. Finally, conclusions and implications of our findings are discussed and directions for future research are offered in Section 5.

2. Literature review and hypotheses development

2.1. The impact of financial reform on banking operating efficiency

Although a primary goal of deregulation is to increase competition in the markets and in turn improve efficiency, numerous studies examining the impact of financial reforms on banking efficiency provide mixed results.[5] Some studies suggest that financial reform

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