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Using Malmquist Indexes to measure changes in the productivity and efficiency of US accounting firms before and after the Sarbanes–Oxley Act ☆

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ABSTRACT

There have been many criticisms of the Sarbanes–Oxley (SOX) Act passed in July of 2002 to correct business accountability and performance practices. The act has a major emphasis on accounting and its practices. This paper attempts a response to these criticisms by investigating changes in productive efficiency for 62 of the largest US public accounting firms between the periods (2000–2001) and (2003–2004)—the periods before and after enactment of SOX in July of 2002. DEA is used to calculate Malmquist indexes of productivity and efficiency changes. This index is used because it can distinguish between changes in technical efficiency, which limit the possibilities, and changes in the performance efficiencies for each firm. Contrary to many of the criticisms, results indicate that accounting firms have exhibited significant post SOX growth in productive efficiency which is better than pre-SOX performances.

1. Introduction

There has been a large and very vocal outburst of criticisms of the Sarbanes–Oxley (SOX) act passed by Congress in July of 2002 and signed by President Bush. This act is aimed at correcting practices believed to be associated with the recent parade of business and accounting scandals. See Prentice and Spence [1] for a comprehensive survey of these criticisms and possible responses. See also Prentice [2].

Many of these criticisms are reminiscent of the similar criticisms evoked by the Securities and Securities Exchange acts of the 1930s which represented responses to similar deficiencies in business accounting and financial practices that were believed to have led to the 1929 stock market crash and the subsequent "great depression." These 1930s criticisms have long since abated, however, and, as noted in Prentice [2], the regulatory activities—especially the accountability and full disclosure requirements associated with these laws—have now become models for other countries to follow.

See also Ijiri [3] who describes the reaction to the legislation directed to accounting reform in the 1930s as well as to SOX—which Ijiri refers to as the "reform bill," that was in process at the time of his writing. This is all preparatory to his discussion of the need to focus on "procedural fairness" instead of the "fairness" concepts that have been a guide to FASB and its predecessors going back to the 1930s.

Comment 1. The prospect of prohibiting simultaneous provision of accounting-audit services and the more profitable MAS (management advisory services) was of particular concern to the accounting industry which mounted a campaign against this legislation. However, a veritable flood of scandals, some involving accounting firms, swept aside these

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objections. See Asare et al. [4] who used a designed experiment to test these conflicting claims and found that their results were consistent with the claim of the accounting industry that this practice was not associated with higher risks.

Other papers also appearing in JAPP that deal with effects of SOX on accounting include Zhang et al. [5], which deals with internal control weaknesses and finds that recent auditor changes are more likely to be associated internal control weaknesses. See also Krishnan [6]. Gordon et al. [7] find strong evidence that corporation information security activities are receiving more focus since the passage of SOX, and Cullinan et al. [8] who find a significant association between executive loans and financial misstatements. Thus, these studies as well as others we examined, deal with propriety whereas we deal with performance efficiencies.

In this paper we report on an inquiry directed to ascertaining performance effects of SOX (if any) on 62 of the largest US public accounting firms. We selected accounting firms partly because of data availability (at the early stage, 2005, when the data for this study were collected) but also because accounting firms and practices constitute a center piece of this legislation.

For this study we divided the data into two groups: post-SOX (2003–2004) and pre-SOX (2000–2001). We then employed a relatively new version of the Malmquist Index to evaluate the changes, if any, in performance efficiencies of these 62 firms. We chose the "Malmquist index" to study these changes because this index makes it possible to distinguish between effects that reflect changes in efficiency that are due to the firm performances and the effects that are associated with changes in the productive possibilities associated with legislations, etc. (The latter effects can be regarded as externalities that affect the productive possibilities for accounting performances—e.g., effects on financial markets, where critics claim that expenses arising from the need for complying with the information requirements imposed by SOX result in diversions of IPOs from US to foreign financial markets.) See Prentice [2].

2. Background

Before turning to the technical developments we start by focusing on the pertinent parts of SOX. In response to a wave of corporate reporting and related accountancy scandals, Congress passed the SOX Act of 2002 which is directed to improving corporate governance and auditor independence as well as to increasing the reliability of financial reporting. See Chang et al. [9]. The main sections of SOX that affect accounting firms include: (1) Section 101, which establishes a new regulatory board, the Public Company Accounting Oversight Board (PCAOB), that is to (a) set the standards for auditing and related attestation services and (b) ensure compliance with these standards[1]; (2) Section 201, which restricts auditors from providing certain consulting services to their public audit clients; (3) Section 203, which deals with mandatory audit partner rotation; and (4) Section 404 which requires company managements to provide assessments of the effectiveness of their internal control systems and requires auditors to attest to these management assessments.

These four sections of SOX are intended to change the practices of the public accounting industry. However, Sections 201 and 404 have more direct and specific effects on the services that accounting firms offer and hence on their productivity and efficiency. For instance, Section 201 of the act prohibits an auditor from providing any of the following (previously provided) services to its clients: bookkeeping, financial information systems designs and implementation, appraisals or valuations as in actuarial services, internal audit outsourcing, management and human resources, broker/dealer and investment banking, and legal or expert services unrelated to audit services. Levitt [10] argues that non-audit services such as MAS are lucrative and yield higher margins than do the audit fees of public accounting firms. Since MAS services are (or were) more productive in generating revenues for given levels of human resource inputs—Banker et al. [11]—such a restriction on MAS services is likely to decrease accounting firm productivity and efficiency.

Moving in an opposite direction, Section 404 of the act requires company managements to evaluate their internal control systems and requires auditors to attest to these management assessments of the system as part of the overall audit engagement. Accounting firms generate revenues from these additional audit procedures and accounting/consulting services. On the audit services side, auditors charge for these additional audit steps and procedures, and this results in a potential increase in audit revenues. On the accounting/consulting services side, many companies hire accounting firms other than their own auditors as consultants to document or update and test their internal control systems as required by Section 404. Performance of these services increases revenues of accounting firms. In fact, a recent survey, which covers 217 corporations with revenues of at least $5 billion, reports that these firms spent an average of $4.36 million to comply with Section 404 in 2004. The additional audit fees paid for these system reviews and attestations represented an average increase of 57% over the regular financial statement audit fees. See Financial Executives International [12]. With large-scale implementation of Section 404, accounting firms can be expected to generate revenue increments and improve their productivity and efficiency by offering Section 404 compliance services.

There are still further effects to consider. According to the findings in Dopuch et al. [13], non-audit services affect the efficiency and effectiveness of audit services. Since the provision of such non-audit services provides auditors with access to information they could not otherwise gain, the efficiency and effectiveness of audits could be improved through knowledge spillover Simunic [14]. However, according to Whisenant et al. [15] the pricing of audit and MAS services,

[1] This is another example of an externality effect since PCAOB actions can impact clients as well as the accounting firms that serve them.