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Do university mergers create academic synergy? Evidence from China and the Nordic Countries

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ABSTRACT

Since the late 1990s, mergers have been pursued by a large number of national university systems. The mergers have been justified as a way of increasing research performance. This paper examines the impact of mergers on one vital measure of university research performance, the production of publications, for 29 Chinese university mergers and 8 Nordic university mergers. Using Web of Science counts of research articles before and after a merger while controlling for the university inputs of R & D funding and research personnel, it was found that Chinese universities exhibited a small but significant increase in the rate of growth of articles following a merger. The Nordic performance was less clear cut. Our findings support the belief that mergers of similarly sized institutions usually have little impact on research performance. In contrast, mergers between a large comprehensive university and much smaller universities have a positive impact on overall publications. We also show that cases in which the merger was between a comprehensive university and a medical school resulted in significantly improved performance in terms of scholarly publications. We attribute the improvement to synergies between the basic biological research in the comprehensive university and the more practical research undertaken in medical schools. We conclude with suggestions for policy-makers aiming to create synergies through mergers.

1. Introduction

Since the early 1990s, university mergers have occurred in many countries, often because policy makers believed that their higher education systems were inefficient, underperforming, and in need of reorganization (Fielden, 1991; Pruvot et al., 2015a; Yang, 2015). Such university mergers were frequently part of larger reform programs in academia (Harmon and Meek, 2002). Invariably, policy makers and administrators claimed that the mergers would improve academic quality and advance strategic objectives (Pruvot et al., 2015a: 61–62) and that other administrative efficiencies would be achieved. Mergers were also expected to lead to increased competitiveness, usually in international terms and particularly in global ranking; domestic universities, it was believed, are too small to compete against those in the US and, to a lesser degree, the UK (Hazelkorn, 2008).

For the past two decades, institutions of higher education have been buffeted by complex pressures. The drop in their lump-sum funding for research and the concomitant rise in external funding streams, pressure for ranking and comparisons, ongoing globalization and the growing importance of the knowledge-based economy have placed universities at the center of national competitiveness agendas (Sursock and Smidt, 2010). Mergers are a response to these trends, particularly internationally, as policy makers seek to build excellent universities and foster international competitiveness (Salmi, 2009).

In pursuing mergers, larger universities were expected to result in greater recognition (Aula and Tienari, 2011; Salmi, 2009) and have better research performance, especially if specialized faculties (e.g., medical schools) merged with them. Moreover, it was believed that a larger university has a better chance of being considered “world class” in global university-ranking systems. Mergers were expected to yield new institutions that would be more than the sum of their parts (Yuan et al., 2013).

Despite a considerable amount of research on higher education mergers in general, on the rationales of mergers, and on the attributes of successful mergers (Harman and Meek, 2002; Harman and Harman, 2003; Mok, 2005; Skodvin, 1999; Välimaa et al., 2014), less study has been conducted on the impact of mergers on knowledge production, which was the principal goal articulated by policy makers other than operational efficiency (Huang 2015: 208). Following the literature, we distinguish mergers of universities that are roughly equal in size from

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those involving mergers of small universities with large ones, and mergers of a larger, more comprehensive university with a specialized faculty, most often a free-standing medical school. Some case studies have been done (Kyvik and Stensaker, 2013; Norgard and Skodvin, 2002) but relatively few quantitative studies. Further, although the wave of mergers has been global, the existing research is limited in terms of individual mergers or specific countries (for a notable exception, see Pinheiro et al. (2016a), which discusses Nordic countries) or uses truncated periods, which are not likely to capture any synergy that might result from a merger.

Clearly universities are enterprises that produce numerous outputs, but our purpose is to examine the impact of mergers on just one vital measure of university research performance, the production of scholarly publications. Our focus on just this one output is driven in part by the recognition that universities around the world are now assessed almost exclusively along this dimension of activity. Global rankings of universities have become commonplace, and although subject to question, are the primary way universities are measured and compared internationally (Hazelkorn 2014). While domestic rankings such as *US News and World Report* have been around since the 1980s, the appearance of Shanghai Jiao Tong University's Academic Ranking of World Universities (ARWU) in 2003 ushered in the era where universities are ranked internationally along quantitative dimensions.

In addition, we were also interested in viewing university mergers as a treatment affecting the research output of universities. The literature on mergers has laid out several observations about the effectiveness of mergers in general which we hypothesized would result in differential impacts upon one research output − publications. Just as ARWU was constructed using research output measures which were quantitative, internationally comparable, and open to all researchers, our interest in publications as an output was also driven by the availability of such data internationally.

We begin in the next section by discussing the previous research on university mergers, and then outline the hypotheses to be tested in Section 3. In Section 4 we describe how we selected our data, and then discuss the variables and the results of our analysis in Section 5. We close with a discussion and then a conclusion.

2. Previous research

The dominant global trend has been to create fewer, larger, and more comprehensive institutions (Harman and Meek, 2002). Merger research is complicated by the fact that national governments often have used mergers and other forms of consolidation as part of a systemic restructuring of higher education (Olsen and Maassen, 2007). Mergers were expected to lead to an increase in university efficiency and effectiveness, deal with "nonviable" institutions and institutional fragmentation, widen student access, increase course diversity, and serve national and regional economic and social objectives (Harman and Meek, 2002; Pruvot et al., 2015b).

In China, Johnes and Yu (2008) found that research performance is greater at comprehensive universities than at specialized institutions, and thus mergers between them should improve performance.[1] Although the rationale or motivation varies, one consistent theme is the belief that mergers will produce economies of scale and scope (Martin and Samels, 1994), but this article of faith is unproven (Fielden, 1991; Rowley, 1997). Unfortunately, cost savings and other fiscal benefits are difficult to quantify and tend to be overestimated (Patterson, 2000).

[1] Johnes and Johnes (2016) deals with the methodological challenges of estimating cost functions of higher education institutions exhibiting multiple outputs and inputs. Specifically, the article addresses the relative advantages and disadvantages of using data envelope analysis (DEA) and stochastic frontier analysis (SFA) in estimating these cost functions, with a particular application to English universities over the 2013–2014 period.

Other studies on economies of scale have had mixed results. Two studies of US universities as multiproduct institutions using a flexible cost quadratic function of three outputs (undergraduate teaching, graduate teaching, and research) and one input (faculty salaries) show that economies of scale do exist (Cohn et al., 1989; De Groot et al., 1991). Brinkman and Leslie (1986) in a literature review found that two- and four-year institutions enjoy economies of scale but that they are most pronounced for smaller universities. The results at research universities are less clear.

Economies of scale are thought to exist for university research outputs as well as educational outputs, such as number of degrees awarded (Pruvot et al., 2015b). Critical mass is mentioned frequently as one benefit of merging universities, despite the absence of research directly supporting the economies-of-scale hypothesis. In a literature review, Johnston (1994) deduced that most studies found that research had constant returns to scale, and a few discovered economies of scale but only up to a minimum institutional size. Bonaccorsi and Daraio (2005) found no positive relationship between research efficiency, as measured by publications per researcher, and university size and possibly a negative relationship.

Ranking system improvement is another commonly mentioned goal. Some studies have been conducted on the impact of mergers on university rank, in which a belief is expressed that some ranking systems appear to favor large institutions over small ones. For example, in a "what-if" study, Docampo et al. (2015) found that in the Shanghai Jiaotong Academic Ranking of World Universities (AWRU) "the merging of relatively strong universities will, according to ARWU, produce a more highly ranked institution" (p. 189). Thus, beliefs among policy makers about ranking may provide some justification for mergers. The AWRU only began in 2003, however, so we are unable to test this conjecture in this paper.

The final rationale for mergers is that the complementarities that could be created might make it easier for the institutions to compete for grants (Skodvin, 1999). Such gains would presumably be realized from synergies created out of combining disciplines. The merged heterogeneous institutions with different subject portfolios will, it is hoped, create interdisciplinary combinations that will improve research capabilities (Georgiou and Harper, 2015). At the micro level, this intuition is supported, as Ali and Gittelman (2016) found at academic medical centers that the mixing of teams of clinicians and basic biologists can lead to superior innovative results.

In general, the research has been in the form of case studies (Rowley, 1997), in part because obtaining ex ante and ex post time-series data is difficult and results in small sample sizes (Cartwright and Cooper, 1996; Kyvik and Stensaker, 2013). Further, the emphasis is often on implementation, rather than the evaluation of outcomes. For example, a 2002 special edition of *Higher Education* exploring mergers concentrated almost exclusively on the merger process and relied on case studies in all but one instance (Harman and Meek, 2002). More recently, several publications have appeared that focus on international university mergers (Curaj et al., 2015), in Europe (Pruvot et al., 2015b) and in northern Europe (Pinheiro et al., 2016a); these also focused on the process, motivation, and typologies, not on outcomes (Lang, 2003).

Ample disagreement exists about whether mergers have been successful. Rowley (1997) in a survey based study of 30 university mergers in the UK concluded that most of these mergers were a success based on the opinions expressed by university personnel. In contrast, using an ex post questionnaire of two UK universities, Cartwright et al. (2007) concluded that they failed because of mismanagement of human resources. In a case study of Australian institutions merged together in 1988, Gamage (1992) found that the merger was a qualified success but that the expectation of achieving economies of scale was disappointed. Following up on Rowley's (1997) findings, Fielden and Markham (1997) found that merging institutions of higher education did not always result in economies of scale and that unrealistic assumptions by policy-makers were made about the returns.