Chapter 8
The Impact of Scale and Scope on Global University Rankings: What We Know and What We Need to Learn

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ABSTRACT

Economies of scale and scope are increasingly critical for universities operating in globally competitive higher education teaching, research and training markets. This is because the associated cost advantages could enable some institutions to increase their university rankings relatively easier. This chapter investigates the relationships between economies of scale (measured by the number of enrollments) and scope (measured by the number of teaching programs), research performance, and institutional reputation (measured by the ARWU and QS ranking scores). The results show that larger and more diverse institutions tend to have higher scores. However, when separated into public and private universities, the scale and scope effects are not so obvious between private universities and the ARWU ranking scores. Nevertheless, the chapter does identify a significant scope effect in the QS rankings for private institutions, implying that expanding research, teaching, and training programs may benefit these scores.

INTRODUCTION

Raising the world ranking of higher education institutions is increasingly one of the most important issues facing domestic industry stakeholders, especially governments (Dearden, Grewal, & Lilien, 2014; Marope, Wells, & Hazelkorn, 2013). Attention especially focuses on how to increase those tangible easily measured outputs that characterize the primary global university rankings, including the Quacquarelli Symonds (QS) World University Rankings, the Shanghai Jiao Tong Academic Ranking of World Universities (ARWU), the US News Best Global Universities Ranking (USN), and the Times Higher Education World University Rankings (THE). Typically, these rankings all include allowance for the number of publications and citations along with intangible measures such as academic and reviewer reputation.

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In this chapter, we define scale as the number of student enrollments and scope as the number of research or teaching programs in a higher education institution. This enables us to understand how university scores and how their rankings may benefit from its inherent advantages in scale and scope. Economies of scale exist when larger universities are better able to spread the fixed costs of inputs associated with teaching and research outcomes, including intangibles such as goodwill and reputation, across larger and more recognizable levels of output. By implication, larger universities will necessarily perform better if there are significant scale economies in global university production. Similarly, some universities may benefit from scope economies in that a benefit arises between the different dimensions of performance making up the genic ranking, say, between teaching and research, or between reputation as broadly defined and teaching or research outcomes. Carried to the extreme, rankings devoid of consideration of scale and scope may of little operational benefit to universities and others seeking to improve relative performance and therefore rank.

If economies of scale and scope exist in higher education rankings, the cost advantage (lower unit costs from scale economies or lower total costs from scope economies) could make it easier for larger universities easier to attain a higher rank given their lower production costs compared with their small-sized counterparts. Therefore, in practice, scale and scope effects plague rankings of all types and these have the potential to both seriously distort ranking outcomes and any best-practice policy and industry behavior conditional on these rankings (Li, Shankar, & Tang, 2011; Safón, 2013).

These effects are especially increasingly critical for universities operating in globally competitive environments because of the significant role of government funding decisions and verdicts on structural change. Specifically, they could lead to some institutions in some jurisdictions to increase their university ranking. Alternatively, it may be possible through industry restructuring to improve a country's overall rankings significantly. However, no known study has directly examined the possible presence and therefore the influence of scale and scope effects in the main global university rankings. As the first analysis to address the possible correlation between the above effects and global rankings, we select the ARWU and QS ranking scores as our data source mainly because they represent research and reputation-oriented ranking systems, respectively (Hazelkorn, 2014).

This chapter uses the theory of scale and scope economies to investigate empirically the possible links between scale and scope effects on global rankings. To achieve this goal, we first review economies of scale and scope in the academic production process, which will provide us valuable insights and methodology for our further empirical investigations. We then employ exogenous information and a quantitative method to investigate the scale and scope effects in existing ranking outcomes and quantify the precise contribution each makes to the rankings as a whole and by an institution. Finally, we discuss the connection between these scale and scope effects and the rankings, and formulate both useful guidance for refining the various metrics and assess the impact on global, national, regional, and institutional decision-making.

BACKGROUND

In this section, we lay the foundation for investigating scale and scope effects on global rankings. This involves understanding the theory and the cost structure including the types of outputs and the functional form needed in the estimation process. We first introduce the theory of scale and scope economies and then examine the empirical applications to the higher education institutions.