

**Methodological  
Paper**



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## **Evaluation of SMEs Innovativeness Using Patent Stock Variables**

**\*Mamoru Obayashi<sup>a</sup> and Setsuo Yamada<sup>b</sup>**

<sup>a</sup>*School of Commerce, Senshu University, Japan*

<sup>b</sup>*School of Economics, Senshu University, Japan*

**Abstract:** Patent stock is used as a proxy for firm's knowledge capital. It is supposed to be a useful indicator of firm's innovative capacity. However, past studies have relied on simple and incomplete patent counts to quantify an aspect of firm's knowledge stock. It follows that large firms are more innovative than SMEs in most cases. This paper examines candidates of attribute adjusted patent stock considering citations. We find that stock variables created from citation data contain relevant information of firm's knowledge stock. As an example, we calculate various patent stocks and patent quality indices using six Japanese chemical firms consisting of three large firms and three SMEs showing SMEs are more innovative than large firms in some measures.

**Keywords:** SMEs, Innovation, patent, patent stock, knowledge capital, patent citations

### **INTRODUCTION**

According to the "Survey of Research and Development in Japan" of 2005, in-house research spending in all industries in fiscal 2004 amounted to 1.85 trillion yen. Of this amount, in-house research spending by companies having 1-299 employees amounted to only 7.9 percent of all in-house research spending. Although it has been often been pointed out that SMEs possess a creative innovation capacity not possessed by large enterprises, judging from the relative magnitude of R&D spending and registered patents, it would appear that virtually all technological innovation is being led by large enterprises.

