

Purpose

While structural changes have often occurred in some industries over time, they have not in others. For example, technological changes occur rapidly and frequently, a number of new firms enter the markets, and young firms play an important role in information and computer technology-related industries. In contrast, drastic innovation is less likely, barrier to entry is high, and old firms dominate the markets over a long period of time in iron and steel industries. What causes differences in the extent of structural changes between industries? In this dissertation, we address how the extent of structural changes varies across industries. In addition, the extent of structural changes may vary within an industry over time, especially in industries with rapid technological change. Therefore, we investigate dynamic changes within an industry over time as well as differences in structural changes across industries.

In the field of industrial organization, many efforts have been devoted to investigating the relationships between industry-specific characteristics and the intensity of competition in the framework of the Structure-Conduct-Performance (SCP) paradigm. In particular, concentration-performance relationship has attracted large attention among Industrial Organization economists for long time. The main objective of these studies is to assess whether a firm has market power (or monopoly power) in the market. Such studies focused on the relationship between concentration and performance at a given point in time, and argued that concentration is closely associated with a lack of competition. As reviewed by Fisher et al. (1983), however, a snapshot taken at a single point in time does not reveal the competitive process whereby a firm attained its position or the competitive response of rival firms, especially in industries with rapid technological change. Baldwin (1995) also argued that market performance has been studied but remains unconnected to underlying processes. These suggest that we should observe the processes of competition over time in assessing the presence of market power.

In addition, from the perspective of competition policy, many efforts have been made to explore how the likelihood of collusion or the degree of competitive pressure differs between industries. They have attempted to capture the effectiveness of competitive pressure by using measures on concentration, such as the Hirshman-Herfindahl index. However, measures on concentration are likely to lead to misleading interpretation, even when using measures on changes in concentration. As pointed out by Davies and Geroski (1997), for example, even when concentration is constant in a period, the market shares of firms within an industry may change in the period, because there is the possibility that one firm's market share gain is simply be another's loss. Thus, concentration does not necessarily reflect the mobility of firms within an industry. In this dissertation, therefore, we examine intra-industry mobility to capture the process of competition among firms.

Also, most studies on intra-industry mobility have tended to employ cross-sectional data at a given point in time. As Baltagi (2001) pointed out, however, time-series and cross-sectional studies not controlling for individual heterogeneity run the risk of obtaining biased results. On the other hand, some previous studies have added some control variables, such as advertising, and research and development (R&D) intensity, to regression equations, in order to control for differences of industry-specific characteristics other than main variables. However, that is far from being satisfactory in overcoming heterogeneity due to unobservable characteristics. In this respect, panel data has been recently introduced in empirical studies because of its advantage. As is often argued, panel data has more information and variability, and gives less collinearity among the variables, more degrees of freedom and more efficiency. The panel data analysis, it is expected, will provide new findings that reinforce the previous understanding of the dynamics of industries based on the cross-sectional data analysis. In this dissertation, therefore, we employ panel data to account for heterogeneity between industries and to capture the dynamic changes over time.

Moreover, as is often argued, Japanese industries appear to exhibit special characteristics in terms of industrial organization. As Odagiri (1992) pointed out, Japanese firms tend to pursue long-term growth under a system of lifetime employment and internal promotion. As Kaplan (1994) argued, Japanese firms may tend to maximize growth or market share, rather than (short-term) profits or share prices. These characteristics are likely to lead to competition for market share among firms. On the other hand, Japanese industries have often been seen historically as having a high propensity for cooperation between firms. Schaede (2000) emphasized the presence of a cooperative system based on self-regulation through trade associations, weak antimonopoly enforcement, and strong government intervention. Such institutional backgrounds may have some influence on competition between firms. In these respects, research on Japanese industries might be of some interest to the discussion of industrial organization, including competition policy. Using data on Japanese industries, this dissertation examines empirically the dynamics of industries.

Organization of the dissertation

This dissertation is organized as follows.

Chapter 1: Introduction

Chapter 2: Market share instability

Chapter 3: Rank stability in the long run

Chapter 4: The duration of market leadership

Chapter 5: The evolution of market structure in the Japanese motorcycle industry

Chapter 6: Conclusions

This dissertation consists of four empirical studies. Chapter 2 examines the market share instability of leading firms as a measure of intra-industry mobility. Using panel data on Japanese manufacturing industries over the period 1995–2001, we explore the determinants of the market share instability of leading firms. In particular, we examine the relationship between industry concentration and market share instability. As a result, this chapter provides robust evidence on the relationship between concentration and market share instability. In addition, we provide evidence that industry growth is fairly important in explaining the market share instability of leading firms.

While Chapter 2 employs panel data to capture the dynamic changes of industries over time, the observation period of the data set used in the analysis is not sufficiently long to describe the processes of competition in industries with substantial technological change. In the remaining chapters, therefore, we examine the dynamics of industries, using long-term data sets. Chapter 3 investigates rank stability among leading firms in the long run, using data on Japanese producer good industries over the period 1977–2001. In this chapter, we examine the determinants of rank stability among leading firms, and show the effects of the life cycle of an industry and the business cycle of an economy on rank stability. In the analysis, we provide evidence that they have significant effects on rank stability, and we discuss the importance of long-term perspective in studying intra-industry mobility.

In Chapter 4, we explore the persistence of market leadership in Japanese manufacturing industries over the period 1975–2004. By applying survival data techniques, we examine how long market leadership persists, and how the duration of market leadership varies according to industry-specific characteristics. The findings of this chapter indicate that market leadership is persistent in some industries, while it is rather transitory in other industries. The chapter also indicates that market leadership tends to persist in capital-intensive and legally cartelized industries, whereas it is less likely to persist in growing, R&D-intensive and import-intensive industries.

As a supplementary analysis of previous chapters, Chapter 5 explores the evolution of market structure in the Japanese motorcycle industry. Using a newly collected dataset, we describe how entry, exit, product quality, and market share vary from the birth of the industry through maturity. An important feature of the industry is that the number of firms grew and then declined sharply for the first 20 years in the post-war era, and consequently the industry evolved to be an oligopoly. The data show that a great number of entry occurred, product quality continued to be improved, and the market shares of leading firms are fairly volatile in the early and formative phases of the industry. On the other hand, the number of exits increased, and the leadership of industry stabilized in the maturity phase. To address what factors caused a shakeout of producers and shaped the structure of the industry, we conduct a survival analysis and examine the determinants of firm survival. It is found that initial firm size and order-of-entry have significant effects on firm survival, and that the firms which made early and large-scale entry tend to have advantages over late and small entrants. It is also found that product quality played an important role in firm survival and consequently contributed to shaping the structure of the industry. The final chapter summarizes the findings and implications of this dissertation.

Conclusions

In the dissertation, we focused on intra-industry mobility to address the dynamics of industries, using panel data on Japanese industries. In particular, we examined the relationships between industry-specific characteristics and intra-industry mobility. Our studies suggest that industry-specific characteristics are significantly associated with the mobility of firms. The findings from these studies especially indicate that dynamic variables, such as industry growth and industry life-cycle, are fairly important in explaining intra-industry mobility. Furthermore, the findings suggest that technology-related factors were essential for understanding intra-industry mobility. As already discussed, a number of studies have explored how the likelihood of collusion or the degree of competitive pressure differs between industries. In such studies, competition policy makers have traditionally attempted to observe structural differences between industries, using data at a given point in time. For example, when competition policy makers evaluate the presence of collusive behavior or market power in a market, they tend to use data only on market structure or intra-industry mobility at a point in time. However, the most important implication from our studies is that we should observe the processes of industries over a sufficiently long time rather than at a given point in assessing competition. In particular, our evidence strongly suggests that we have to take into account the dynamic process of competition, such as the industry life cycle and technological change, because market structure or mobility at a point in time may be a consequence of fierce competition between firms.

In these respects, it is expected that our empirical studies provide important implications for competition policy.

References

- Baldwin, J. R. (1995), *The Dynamics of Industrial Competition: A North American Perspective*. Cambridge: Cambridge University Press.
- Baltagi, B. H. (2001), *Econometric Analysis of Panel Data. 2nd edition*. New York: John Wiley & Sons.
- Davies, S. W. and P. A. Geroski (1997), "Changes in Concentration, Turbulence, and the Dynamics of Market Shares," *Review of Economics and Statistics*, 79, 383–391.
- Fisher, M. F., J. J. McGowan, and J. E. Greenwood (1983), *Folded, Spindled, and Mutilated: Economic Analysis and U.S. vs. IBM*. Cambridge MA: MIT Press.
- Kaplan, S. N. (1994), "Top Executive Rewards and Firm Performance: A Comparison of Japan and the United States," *Journal of Political Economy*, 102, 510–546.
- Odagiri, H. (1992), *Growth through Competition, Competition through Growth: Strategic Management and the Economy in Japan*. Oxford: Oxford University Press.
- Schaefer, U. (2000), *Cooperative Capitalism: Self-Regulation, Trade Associations, and the Antimonopoly Law in Japan*. Oxford: Oxford University Press.