

From Silicon Valley to Singapore: Location and Competitive Advantage in the Hard Disk Drive Industry. *By David G. McKendrick, Richard F. Doner, and Stephan Haggard.* Stanford, Calif.: Stanford University Press, 2000. 366 pp. Figures, tables, notes, references, index. Cloth, \$49.95; paper, \$22.95. ISBN: cloth 0-804-74152-2; paper 0-804-74183-2.

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This book is a collaborative product of scholars in management, political science, and international relations working under the auspices of a center funded by the Alfred P. Sloan Foundation that is devoted to studying the information storage industry. Drawing on unprecedented data and detailed case studies of leading firms, it traces the history of the disk-drive industry with an eye toward ascertaining the explanation for persistent American dominance. Firms founded in Silicon Valley, where IBM invented magnetic-disk-drive technology during the 1950s, have managed to sustain industry leadership in the face of rapid technological change and significant challenge from Japanese firms.

The authors, well versed in a wide range of literature on industrial competitiveness, entertain a variety of explanations for this persistence. They consider factors such as product and industry life cycles and differences in organizational structure, innovative capacity, and government policy. These factors, while not unimportant to the industry, ultimately fail to explain the differences between American and Japanese firms. To understand them, the authors argue, we must focus upon the remarkable ability of American firms to capitalize on agglomeration effects at home and abroad.

Prior to the development of the personal computer (PC) during the early 1980s, these effects operated in Silicon Valley and a handful of other domestic locales. Firms thrived as a result of their ability to integrate design and manufacturing of a complex and rapidly evolving product that comprised many sophisticated mechanical and electronic components. The range of components opened many frontiers of innovation. A variety of specialist suppliers emerged to funnel innovations to the pioneering disk-drive makers, whose designers and assemblers combined the latest components into finished products. Tight geographic clustering of suppliers and producers facilitated the critical trade-offs necessary to design novel drives and move them rapidly into production and onto the market. Perhaps no other industry, the authors suggest, faced greater pressure to master so many technologies and reduce time to market.

When rapid diffusion of the PC created a mass market for low-cost drives, producers faced enormous pressure to reduce manufacturing costs. Many observers expected Japanese firms to seize the day, as they had in so many other sectors when volume manufacturing grew paramount. In this case, however, American firms prevailed. They did so, the authors argue, by successfully extracting the manufacturing operations from the domestic agglomerations and relocating them to Asian locations, most notably Singapore, Thailand, and Malaysia. Initially, the move offshore involved little more than a search for low-cost labor. The real key to success, however, was the ability of American firms to foster agglomeration effects within the Asian locales. Accomplishing this typically involved not only cultivating networks of private enterprise but also working closely with local and national governments that targeted the disk-drive industry as an engine of growth. Japanese firms, often handicapped by legacies of cultural resentment, failed to develop relationships with host nations so effectively.

The second half of the book studies the Asian disk drive “successes” in detail and compares them with the experiences of nations like Taiwan that failed to foster the industry. Here the authors flesh out the importance of networks while also offering explicit lessons for policy makers. Drive manufacturing thrived in locales like Singapore because their governments welcomed western firms and developed training programs for the industry but did not attempt to support specific firms in the supply chain with subsidies or tariff protection. In these circumstances, vibrant networks of suppliers emerged. The American firms, still needing to integrate design and manufacturing, had a long-term stake in these overseas networks and effectively provided a measure of protection for them in the global market. Asian governments pursuing more targeted and protectionist policies generally met with disappointment. The one exception was Korea, where the computer manufacturer Samsung effectively pursued policies akin to those achieved by American firms and local governments in places like Singapore.

Suggestively melding an appreciation of organizational capabilities and local network effects with a deep understanding of national development policies, this book has implications far beyond the disk-drive industry. Its interdisciplinary perspective provides a fascinating framework for comprehending the dynamics of globalization during the last quarter of a century. The book amply demonstrates the rich potential of centers funded by the Sloan Foundation to foster distinctive cross-disciplinary research on industry.

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