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Japan and the Bigness Mystique

Gary R. Saxonhouse*

Walter Adams and James Brock are correct.¹ There is little overseas evidence to support the proposition that there is a close link between international competitiveness and firm size. As Adams and Brock point out, the Japanese experience, in particular, highlights the absence of any intimate connection between these variables.

The distinctive vitality of Japan's small-scale sector is a very old story. Whether it is the last decades of the Tokugawa period (1600-1868), the Meiji period (1868-1912), the Taisho period (1912-1926), or the Showa (1926-1989) period, commentators have invariably noted the surprising persistence of Japan's smaller-scale enterprises.² Where once they were treated as curious survivals from Japan's "feudal" past, these small units have long been recognized as an essential element in Japan's modern economic growth.

Adams and Brock correctly note that Japan's rapid economic growth in the 1950s and 1960s went hand in hand with generally declining market concentration. This trend has continued into the 1980s. The weighted three-firm concentration ratio and the Herfindahl Index have been falling for most of the period since the late 1960s.³ There has been a sharp decline in the number of mergers in the last twenty years, and an even steeper decline in the number of horizontal mergers.⁴ The declining

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¹ Adams & Brock, *The Bigness Mystique and the Merger Policy Debate: An International Perspective*, 9 NW. J. INT'L L. & BUS. 1 (1988).

² Smith, *Farm Family By-Employments in Pre-Industrial Japan*, 29 J. ECON. HIST. 687 (1969); U. TEIJIRO, *THE SMALL INDUSTRIES OF JAPAN: THEIR GROWTH AND DEVELOPMENT* (1938); W. LOCKWOOD, *THE ECONOMIC DEVELOPMENT OF JAPAN* (1954); K. OHKAWA AND H. ROSOVSKY, *JAPANESE ECONOMIC GROWTH; TREND ACCELERATION IN THE TWENTIETH CENTURY* (1973); and CHUSHO KIGYŌ CHO, *CHUSHO KIGYŌ HAKUSHŌ* (1987).

³ AKIRA SENŌ, *GENDAI NIHON NO SANGYŌ SHŪCHŪ* (1983).

⁴ KŌSEI TORIHIKI IINKAI, *NENJI HŌKOKU* (1985)(hereinafter KŌSEI). In the last few years

number of horizontal mergers reflects the increasingly effective anti-merger policy of Japan's *Kōsei Torihiki Iinkai* (Fair Trade Commission).⁵

Unlike the period on which Adams and Brock report, these aggregate trends in the 1970s and 1980s do mask rather different experiences at an industry level. During the 1970s and 1980s, the three-firm concentration ratio rose in ten Japanese industries while falling in nine others.⁶ Concentration rose in relatively declining industries, such as textiles, pulp and paper, chemicals, petroleum and coal products, and clay and stone, while declining in the most rapidly growing capital goods and consumer goods industries.

It is one thing to say that industrial concentration has generally been declining in recent decades in Japan and that smaller firms have demonstrated a special vitality, but it is quite another to suggest that the existence of small firms have contributed to Japan's great leap in technological improvement and international competitiveness. Small Japanese firms do appear to play a much more important role in research and development than do their counterparts in the United States. In 1985, for example, Japanese firms with under one thousand employees accounted for 14.5% of all research and development ("R&D") expenditures by private business in Japan.⁷ Despite all that has been written about small, venture capital-driven, technologically-intensive firms in the United States, this is several times greater than R&D expenditures by similarly situated United States firms.⁸

Over time, however, the role of small firms in Japanese R&D expenditures has become less important. Between 1971 and 1985, the share of smaller Japanese firms in total private business R&D expenditures declined by over 20%.⁹ Interestingly, during much the same period a similar sharp decline occurred in the United States.¹⁰

The relatively large amount invested in R&D by small firms in Japan, and the comparatively modest proportion spent by small firms in the United States, may seem surprising in view of the policies each coun-

there has been a rise in the number of mergers. Overall numbers, however, remain well below the levels of even the 1970s.

⁵ Hiroshi Iyori, *Anti-trust and Industrial Policies in Japan: Competition and Cooperation*, in *LAW AND TRADE ISSUES OF THE JAPANESE ECONOMY* (G. Saxonhouse & K. Yamamura, eds. 1986).

⁶ KŌSEI, *supra* note 4.

⁷ SŌMUCHO, TŌKEI KYOKU, *KAGAKU GIJUTSU KENKYŪ CHŌSA HŌKOKU* (1986).

⁸ NATIONAL SCIENCE BOARD, *SCIENCE INDICATORS 1982* (1983).

⁹ SŌMUCHO, *supra* note 7.

¹⁰ NATIONAL SCIENCE BOARD, *supra* note 8.

try had in place during much of the 1970s and 1980s.¹¹ Unlike Japan, the United States government has devised policies consciously aimed at allowing small, research-oriented firms to play a critical role in the development of new technology. Accordingly, in the United States the R&D tax credit can be used to offset 100% of corporate income. Under the R&D tax credit in Japan, which served as the model for the United States credit, only 10% of corporate income can be offset. Consequently, small firms in Japan, for whom research is a primary activity, do not benefit greatly from the R&D tax credit; nor do they enjoy the special tax encouragement their United States counterparts received between the mid-1970s and the mid-1980s from limited R&D partnerships, subchapter S corporations, small business investment corporations, pension fund investments in venture capital partnerships, and simplified registration requirements for initial small public offerings of equity. Many of these United States incentives emerged from legislative and administrative changes since the mid-1970s, causing concern in Japan that the United States may have acquired new special advantages in the promotion of high technology.¹² The United States Tax Reform Act of 1986 phased out, or otherwise diminished, the significance of many of these special provisions.

Although small-scale Japanese firms account for a much higher proportion of R&D expenditures than do their United States counterparts, the level of research intensity is somewhat lower. In 1981, R&D expenditures by small firms with under one thousand employees in the United States were 1.6% of total sales. For Japanese firms of this size, 1985 R&D expenditures came to 1.5% of sales. The larger R&D expenditures of small firms in Japan can be explained by their larger overall presence in the Japanese economy. Indeed, the long-term decline of R&D expenditures by small firms in the United States (from 11% in 1957 to 4.1% in 1985) is only marginally affected by changes in the research intensity for small versus large firms; the main explanation is the smaller number of firms that employ less than one thousand workers in the United States economy.

Such data, however, must be understood within the context of the different corporate environments and organizational structures. For ex-

¹¹ It is particularly difficult to find convincing comprehensive evidence for the view expressed in Aoki, *Horizontal vs. Vertical Information Structure of the Firm*, 76 AM. ECON. REV. 971 (1986), that smaller firms have become increasingly important in promoting Japanese technological innovations in the 1970s and the 1980s. As noted above, the aggregate research and development evidence appears to point in the opposite direction.

¹² The operation of these incentives is described in more detail in Saxonhouse, *Biotechnology in Japan: Industrial Policy and Factor Market Distortions*, 3 PROMETHEUS 277 (1985).

ample, differences in Japanese and United States legal, accounting, and tax practices have made it advantageous for many Japanese firms to eschew the formal, vertically-integrated structure characteristic of large firms in the United States. Only since 1977 have large Japanese corporations been required to maintain a common settlement date and to consolidate balance sheets and the income and earnings statements of their less-than-wholly-owned subsidiaries. This makes it entirely possible that some significant portion of the R&D carried out by small Japanese firms is actually initiated and administered by larger parent companies.¹³

It should also be understood that the relative shares of R&D expenditures undertaken by small versus large firms are not closely correlated with most of the prominent measures of research productivity for either group. In 1980, small firms accounted for only 4.1% of business R&D expenditures in the United States, but these firms produced 19% of all patents.¹⁴ By contrast, in Japan, small firms, which accounted for 14.5% of all business R&D expenditures, produced only 10% of all patents. Given the much lower R&D interest of small firms in general, the United States figures imply a high patent productivity per unit of R&D intensity. Despite major differences in Japanese and United States behavior with respect to the filing of patent applications, small United States firms produce patents at a higher rate (per unit of input) than either larger United States firms or small Japanese firms.¹⁵

There are many observers, both Japanese and foreign, who will agree that there is no simple relationship between international competitiveness and firm size, but will still argue that firm size does not accurately index the scale of potential Japanese undertakings. For example, Lester Thurow writes:

The problem is not to pick the sunrise industries of the year 2000. No one can do that. The problem is to strengthen the industries that are now sunrise industries and to promote cooperation between public and private research and development projects that might lead to the sunrise industries of the year 2000. In Japan, such private-public cooperative research projects are the heart of MITI's current industrial development strategy. They ought to be the heart of ours.¹⁶

As with firm size and international competitiveness, evidence appears equally lacking for the proposition that government-initiated joint

¹³ For a related discussion, see Masahiko, *supra* note 11.

¹⁴ UNITED STATES PATENT & TRADEMARK OFFICE, SMALL BUSINESS PATENTING (1982).

¹⁵ These findings are consistent with sample data which also find that small and moderate size firms in Japan seem to have contributed less to innovation than their counterparts in the United States. See Mansfield, *Industrial R&D in Japan and the United States: A Comparative Study*, 78 AM. ECON. REV. 223 (1988).

¹⁶ Thurow, *How to Rescue a Drowning Economy*, N.Y. REV. OF BOOKS, Apr. 1, 1982.

R&D ventures among Japanese firms and government research laboratories have given Japanese industries a special advantage in competing with their overseas rivals. Despite the extremely strong United States interest in emulating this Japanese practice, which has resulted in changes in United States anti-trust laws and in the creation of joint ventures such as Sematech and the Microelectronics and Computer Technology Research Corporation, there is considerable skepticism in Japan concerning the benefits of joint projects.¹⁷ This skepticism rests on familiar evidence that industry leaders are reluctant to participate in such projects, that there is relatively little common research undertaken by firms participating in such projects, and that what new information-sharing does result for Japanese participants in such projects already occurs under other auspices in the United States and Europe.

Cooperative research and development projects are important in Japan only because, relative to other industrialized countries and particularly the United States, in Japan there is much less informal communication and cooperation among scientists working in different firms. In the United States, for example, the diffusion of useful research results among firms is possible because of the high degree of professional orientation of United States R&D workers. This pattern has developed in the United States because of the strong, common theoretical background of university-trained R&D staff which not only facilitates communication but also creates labor market-related incentives for communicating effectively with R&D workers at other firms.

To the extent that such informal communication is useful, and to the extent that it is facilitated by having professionally oriented technical and managerial personnel, it is quite possible that Japan, by virtue of having an employment system with low inter-firm mobility and an emphasis on in-house training, does have a competitive handicap. More narrowly, the Japanese government's inter-firm cooperative research projects can be viewed as an effort to insure that Japanese R&D efforts do not become, by virtue of Japan's permanent employment system, still more narrowly firm-specific than is true in the United States. Rather than perceiving such actions as an effort to pool R&D resources in a way not possible in the United States to create special competitive strength, such projects are best viewed as a substitute for the unusual degree of

¹⁷ JOINT RESEARCH AND DEVELOPMENT VENTURES AND THE JAPANESE ECONOMY: HEARINGS ON INDUSTRIAL POLICY: ANTI-TRUST AND JOINT RESEARCH AND DEVELOPMENT VENTURES BEFORE THE JOINT ECON. COMMITTEE, 98th Cong., 2d Sess. (1983)(statement of Gary Saxonhouse).

informal interfirm communication which takes place among the more professionally oriented R&D personnel in the United States.