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THE JAPANESE FIRM

Sources of Competitive Strength

Edited by
MASAHIKO AOKI
RONALD DORE

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OXFORD UNIVERSITY PRESS

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OXFORD
UNIVERSITY PRESS

Great Clarendon Street, Oxford OX2 6DP

Oxford University Press is a department of the University of Oxford.
It furthers the University's objective of excellence in research, scholarship,
and education by publishing worldwide in

Oxford New York

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Kuala Lumpur Madrid Melbourne Mexico City Nairobi
New Delhi Shanghai Taipei Toronto

With offices in

Argentina Austria Brazil Chile Czech Republic France Greece
Guatemala Hungary Italy Japan South Korea Poland Portugal
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Published in the United States
by Oxford University Press Inc., New York

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ISBN 978-0-19-829215-9

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FOREWORD

With a considerable lag, Japan's importance to the world economy has begun to leave its imprint in the curricula of universities in the West. Most leading US undergraduate and graduate institutions now offer courses on the Japanese economy. Several general textbooks and selections of readings for college students have been published to meet the increasing demand.

This is all valuable, but the next step is more important, and much harder to achieve: to integrate the study of Japan's economy into our core courses of economics and business administration. Students of economics should understand not only the role of the Federal Reserve Bank and the Bundesbank but also that of the Bank of Japan, and they should be familiar not only with the institutions active on Wall Street and in the City of London, but also with those operating in Kabutocho. Business school students should encounter not only cases developed based on the experiences of IBM and Caterpillar but also those taking the perspective of Fujitsu and Komatsu as well as those of Siemens and ABB. Such integration is a prerequisite for the true internationalization of our educational institutions. It is in this process that the present volume will prove its importance.

The contributors to this book clearly demonstrate that the integration of the study of the Japanese economy has proceeded much further in research than in teaching. Only a decade ago the study of Japan's economy was a separate field attracting a small number of specialists. Today much of the academic work on this topic is done in the mainstream of the disciplines of economics and business administration. Studies based on Japanese data now play an important role in the development of both the empirical and the theoretical bases. In the process many Western researchers have spent considerable time in Japan and acquired in-depth knowledge of various aspects of the Japanese economy. Indeed, a number of scholars close to the core of their respective disciplines, but not specialized in the study of Japan, have made significant contributions to our knowledge of Japan in recent years.

In fact, as noted by one of the authors in this volume, the study of the Japanese economy has been a remarkably successful area of research in the last decade. By now we know that what brought Japan economic success was much less of a 'miracle', at least in the supernatural or divine sense of the word, but more a matter of institutional design at all levels from the central administration down to the shop floor. Many of the traits widely perceived as uniquely Japanese were, in fact, imported from the West relatively recently and integrated into existing institutional arrangements. We have also learned that the Japanese economy is much more diverse, and much more competitive, than previously portrayed.

This volume also illustrates how the nature of the academic study of the Japanese economy has changed during this decade. Whereas the research in the 1970s and early 1980s described individual traits of economic and social institutions in Japan, the contributions in this volume focus on the interconnectedness of various institutional arrangements. Most of the authors also explicitly take a comparative perspective including data from the United States and Europe in their analyses. While much of the earlier academic work was static in nature, many of the following chapters emphasize the dynamic properties of the studied institutions — how they adjust to changes in their environment and how they generate and incorporate new knowledge to achieve sustained economic growth. In addition, the various contributions provide ample evidence of the increasingly interdisciplinary nature of this literature: the authors with economics backgrounds use methods from other disciplines, and those trained in sociology and behavioural sciences frequently rely on concepts from modern economics.

It should be noted, however, that much of the progress in academic research on the Japanese economy and the introduction of this work into the university curricula have taken place in the United States. Until recently there has been a conspicuous lack of academic research on the Japanese economy in Europe. This ignorance is reflected also in policy-related circles, and in the business community. In general, Japanese language skills are very rare, and first-hand experience of Japanese society is confined to a small group of specialists.

There are, nevertheless, encouraging signs that the situation in Europe is improving. As in the United States, the penetration of Japanese products in important market segments has gradually made the European public aware of the importance of Japan in the world economy. In Sweden, we see this interest being reflected in a surge of students wishing to learn Japanese and to devote their university studies to Japan and East Asia. At the Stockholm School of Economics, a number of students are admitted each year partly because of their skills in the Japanese language. Growing numbers of students take courses on Japanese and East Asian economic affairs as part of the requirements for their degrees. We send students to study at leading universities in Japan, and we receive some—albeit few—Japanese students every year as part of our international student exchange programme.

We see the creation of the European Institute of Japanese Studies as a most important and ambitious part of our strategy. The Institute aims to be a centre of excellence in research and education on the Japanese and East Asian economies and enterprises, on their impact on the world economy, and especially in regard to Euro-Japanese relations. As the Euro-Japanese relationship has often, rightly, been described as the weak link in the world economy, a major goal of the Institute is to fill the Euro-Japanese

'knowledge gap'. With the field of Japanese economic and business studies in the West having been dominated by American scholars, the greater insertion of the European dimension should further contribute both to a deeper comparative perspective for the analysis of Japan and to an understanding of the cultural dynamics of the global economic and business environments.

At the Stockholm School of Economics we are deeply honoured by the dedication of this excellent book to our efforts to promote the study of the Japanese economy. However, all credit should really go to the editors of this volume, Professors Masahiko Aoki and Ronald Dore.

Professors Aoki and Dore have played major roles in improving the general understanding of the Japanese economy. Professor Aoki has worked from within the paradigm of modern economics to open it up to incorporate insights from neighbouring disciplines. From his standpoint as a sociologist with deep insights into the workings of economic organizations in Japan, Professor Dore has approached economics from the outside, questioning many of its basic assumptions and methods. When we asked these two pioneers in the study of the Japanese economy to serve as co-chairmen for our conference 'Japan in a Global Economy: A European Perspective', we hoped for a fruitful interaction between their respective fields of research. The high quality and interesting content of the contributions to this volume has proved us right.

We owe deep gratitude to Professors Aoki and Dore for their relentless efforts to bring together such a distinguished group of scholars on the Japanese economy. Without their enthusiasm, the conference, let alone this book, would never have been possible.

Many thanks should also be given to the Prince Bertil Foundation at the Stockholm School of Economics which made it financially possible to organize this important conference.

STÖFFAN BURENSTAM LINDER

Stockholm

February 1993

PREFACE

The inspiration for this volume was a most stimulating conference at the Stockholm School of Economics in September 1991, attended by a wide range of leading academic students of Japan from four continents. It was a 'pre-foundation conference' for the European Institute for Japanese Studies and ten of the fourteen papers of this volume were first given there. The Institute was formally opened at the School a year later. We would like to dedicate this volume to that Institute and to its founder Dr Staffan Burenstam Linder. We congratulate them on an important initiative, and look forward to its growth as a centre of excellence and a source of new insights into 'how Japan works'.

We would like to thank the organizers of the Stockholm conference, Dr Thomas Andersson and Dr Erik Berglöf. Acknowledgement is also due to the editors and publishers of those of the papers in this volume which have earlier appeared in journals. The papers are Chapter 9 (Hidetoshi Ito) *Ricerche Economiche* 45, 1991, 345–76, and Chapter 13 (Tetsuji Okazaki) *Journal of the Japanese and International Economies* 7, 1993, 175–203.

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Introduction

MASAHIKO AOKI AND RONALD DORE

The literature on the Japanese firm grows by the day, but this particular collection of papers can claim the reader's attention for at least four reasons.

The first is its interdisciplinarity. Not only are the papers written by specialists in diverse disciplines, ranging from theoretical and institutional economics to economic history, econometrics, sociology, organizational theory, political science, and engineering, but the papers themselves are catholic in their approach. The authors have tried to relate their own interpretations to those deriving from other disciplines, rather than ploughing a lonely furrow of their own. We hope that this interactive multidisciplinary approach makes for a broader and richer perspective on what is, by any reckoning, a complex phenomenon.

A second dominant characteristic is what one might call a shared 'systemic awareness'. No one here claims to have discovered *the* secret of the Japanese firm, the autonomous factor that explains its competitive strength. Whether their topic be human resource management, the organization of innovation, or *keiretsu* ties, most of our authors see the specific attributes of the Japanese firm with which they deal as elements of a broader system the parts of which are dependent on other parts for their effective functioning. We believe that the range of 'parts' that are treated in these chapters and this recognition of interrelatedness add up to a comprehensive survey of the rich complexity of the Japanese firm.

But systems can be systems of systems. If the firm is a system, so is the economy. The third characteristic of the collection is its recognition of *diversity*. While the main emphasis is on the large corporation whose distinctiveness from its competitors in other countries is most marked, two of the papers deal specifically with the small and medium-sized enterprises which still have a prominent share in both employment and output in the Japanese economy, and with their interrelationships with markets and with government as well as with the larger firms.

Systems can be loosely or tightly integrated; their separate elements may *in themselves* be functional or dysfunctional. Even after millennia of competition for survival, human beings still have appendixes which give them nothing but trouble. The economic version of the Darwinian selection story—that only efficient organizations survive in perfect competition—is subject to even stronger caveats. Nevertheless, in so far as systems *are* integrated, piecemeal change in some of their elements—in response to

demands from outside the system—may be hard to effect. For example, the Japanese firm, embedded in a structure of mutually complementary institutional arrangements for factor markets, relationships with suppliers, relationships with competitors, relationships with government, etc., may find it difficult to adapt its personnel practices to new ‘tastes’ on the part of the Japanese population—new demands for more leisure, more job choice.

And for the same systemic reasons, the transfer of certain elements from one system to another may prove problematic. Problematic, but clearly not impossible. ‘Systemic awareness’ needs to be tempered by a judicious ‘system agnosticism’, and in these papers it generally is. The *comparative* perspective adopted in nearly all these chapters is the book’s fourth characteristic. Some of its chapters, indeed, concentrate specifically on the issue of the transferability and adaptability of Japanese practices, the settings investigated ranging beyond the conventional Anglo-American examples to cover continental European and Nordic economies.

Let us now introduce the individual papers and try to relate them to each other. The book opens with a chapter by Masahiko Aoki entitled ‘The Japanese Firm as a System of Attributes’, which surveys recent achievements of the economic research programme on the Japanese firm and sets its possible research agenda. The chapter makes a clear manifestation of the ‘systematic awareness’ referred to above. Instead of merely listing major works on various attributes of the Japanese firm—such as employment systems, internal co-ordination, subcontracting relationships, main bank relationships, corporate governance—in parallel, the chapter attempts to identify their possible mutual dependencies and tries to relate and arrange contributions from different sub-fields of economics from a systematic perspective. Also, the chapter recognizes the roles of institutions, such as norms, regulations, organizations of exclusive membership, that support the reciprocal interactions of agents as equilibrium behaviour. In this regard, the chapter may be regarded as an economist’s attempt to bridge a gap between the traditional economic approach and other disciplines (such as sociology, political science, law).

The next three chapters deal with human resource management, specifically, in-house training, of the Japanese firm. Kazuo Koike, the author of Chapter 2, ‘Learning and Incentive Systems in Japanese Industry’, has been very influential among economists in interpreting the nature of shop-floor efficiency within the Japanese firm. He has stressed the importance of the worker’s capacity to adapt to changes in tasks and cope with unforeseen events such as machine breakdown, as distinguished from the operational skills useful for performing routine tasks. On the basis of this distinction, he has identified two types of work organization: the separate system, in which standard operating tasks and problem-solving tasks are entrusted to different specialized workers, and the integrative system, in which two types

of tasks are integrated in individual workers. Koike has long argued that the essence of what appears to be teamwork or group-oriented behaviour at the Japanese factory is actually not so much collective as the exercise of the individual's 'intellectual skill' in performing the non-routine element of tasks in the integrative system. In this chapter Koike discusses incentive and monitoring schemes for promoting and rewarding the formation of such skill on the basis of field observation of a Japanese car manufacturing plant. He also finds essentially similar practices at several Swedish factories which he visited.

Chapter 3, 'Different Quality Paradigms and their Implications for Organizational Learning', is by sociologist and organizational theorist Robert Cole. In dealing with a similar subject (learning) to that of Koike, his focus is more on its organizational aspect. To be sure, there cannot be organizational learning which does not presume individual learning; but the organization itself may be said to learn by identifying the best operational practices, standardizing these practices, and diffusing them throughout the organization as routines that guide individual behaviour. These processes may be carried out through traditional hierarchical authority structures or through more peer-to-peer learning activities. The chapter first sets out the traditional Taylor approach to quality as 'controlling' to an acceptable level the (inevitable) occurrence of defects in an authoritarian setting in which management specialists direct organizational learning. Then it analyses the emerged Japanese approach, which seeks ever-increasing 'improvement' of quality and organizes firms on the assumption that workers as well as managers can be induced to share the quality improvement goals. Recognizing that upstream prevention activities, rather than downstream inspection, are keys to quality improvement, and that many quality failures occur at the boundaries between functional specialities, lateral cross-functional interactions are promoted. Cole points out, as do the previous two authors, that the organizational approach to personnel administration provides a proper incentive framework for the Japanese quality control paradigm. This point, however, raises an interesting question of the transferability of the Japanese quality control paradigm to the West, where institutional setups for personnel administration and unionization have been traditionally different from those in Japan. He concludes the chapter with a few interesting theoretical remarks on this factor.

The issue of transferability of the Japanese practices can, of course, be settled ultimately only in practice. By then, however, the systematic accumulation of knowledge regarding how transplants fare in different national economic systems will provide valuable material for analytical thinking on this issue. Chapter 4 by Mari Sako, entitled 'Training, Productivity and Quality Control in Japanese Multinational Companies', is helpful in enriching such knowledge. This chapter is a report of research in eight plants in Britain and six plants in Germany of Japanese multinational

firms, making colour television sets, video cassette recorders, and semiconductor chips. The focus of study is on internal training of workers, shop-floor work organization, and the use of machinery. In each plant, there prevails the Japanese training philosophy that a reliance on on-the-job training, in-house training courses, and internal promotion is the only way to cultivate a worker's capacity for enhancing plant-wide performance. However, actual practices at those transplants were found to be constrained by, and fitted into, the respective national systems, particularly in labour market institutions, regulations on apprenticeships and vocational qualifications, the accumulated competence of workers, and the quality of general education. Then the productivity and quality performances at those plants are compared with each other as well as with their headquarter-plants in Japan. This study also may be seen as illuminating the workings of the British and German vocational education and training institutions.

Another international comparison, this time between Japanese home and overseas practices and Anglo-American practices, is the theme of Chapter 5, 'Co-ordination between Production and Distribution in a Globalizing Network of Firms', by Banri Asanuma. The author's previous works were directed to subcontracting relationships in the Japanese car industry and have had considerable impact on rethinking the reasons for their widespread existence. Whereas subcontracting relationships had previously been thought of largely as a device enabling large, powerful manufacturers to exploit and utilize small subcontractors as business cycle buffers, Asanuma ascertained, on the basis of detailed field research, that the efficiency of the Japanese car industry owed a great deal to suppliers' own designing capacity. In this chapter Asanuma turns to the downstream side of the core firm, the major assembling firm. He traces the historical development of production scheduling procedures in response to demand situations and the nature of dealer-manufacturer relationships in them. He makes the point that the Japanese core firm has come to realize a faster and more flexible manufacturing response to actual customers' demand occurring at the dealer's end, but that such capability needs to be supported by greater information-processing responsibilities on the dealer's side combined with more flexible manufacturing capability on the supplier's side. He notes that, although dealers for US manufacturers are allowed greater discretion in sending orders to the manufacturers, accumulated disequilibrium between actual orders and production sometimes has to be restored by a drastic change in production scheduling accompanied by the shutdown of an assembly plant at very short notice.

The next two chapters deal with R&D organizations of Japanese firms. Chapter 6, 'The Evolution of Japan's Industrial Research and Development' by D. Eleanor Westney, is a survey of both the macro data on national trends and the micro data on organizational structures of Japanese R&D. The macro part makes the point that high R&D expenditure by Japanese

firms has been a trend that started long before the first Oil Shock. The micro part, on firm organization, starts with useful history concerning changes in the pattern of division of labour between central, divisional, and factory research labs. It then reviews the accumulated body of information—much of it accumulated by the author herself—on research careers, reward structures, professional self-images, the role of Ph.D. research and qualifications, corporate university links, and the relation of all these to research productivity. She finds a strong isomorphic pattern of career and incentive structure between the Japanese manufacturing and R&D organizations. She also discusses trends for major corporations to hive more and more work off to subsidiaries, one of the purposes of which is to introduce salary and security differentials between different functions, and she examines the nature of the links between R&D workers in core firm and those in subsidiaries. The chapter closes by pointing out that research managers of Japanese firms are concerned increasingly with the challenge of building more creative organizations with greater capabilities in basic research and radical product innovations. For that purpose, they are trying to draw on their Western counterparts for organizational technology.

Chapter 7, 'R&D Organization in Japanese and American Semiconductor Firms', is a collaborative work by political scientist Daniel I. Okimoto and engineer Yoshio Nishi. They deal with the same organizational aspect as Westney, but focus more sharply on the semiconductor industry. They address an interesting question that arises from close observations of this particular industry, but could be of far-reaching relevancy: why the Japanese R&D organization is well adapted for certain kinds of innovation, such as DRAMs (Dynamic Random Access Memories), where the technological trajectories are predictable, but are not well adapted for producing pivotal new products or process technologies, such as MPUs (microprocessing units). The authors observe that the direction and capability of the Japanese R&D organizations is facilitated and, at the same time, constrained by the permanent employment system of engineers. They argue that it is the constant size of its R&D work-force, more than superior corporate planning and strategy, that explains the steady flow of innovation. Close communications among engineers and manufacturing, as well as collective learning capacity, made possible through long-term association of engineers, facilitate the transfer of technology from prototype to mass manufacturing. But, they also argue, the practice of permanent employment of engineers constrains the innovative efforts of the Japanese firm in a rather conservative direction. They point out that Japanese firms are trying to break the conservative inertia and make access to leading-edge technology through strategic alliance with foreign companies, particularly American ones. They thus see an important structural interdependence and complementarity of the Japanese and American industries. Whether such interdependency exists only for the semiconductor industry or is potentially a universal phenomenon

is an extremely interesting question for predicting the future of the global economy.

Strategic alliances are also the theme of Chapter 8 by D. Hugh Whittaker, 'SMEs, Entry Barriers, and "Strategic Alliances"'. But here the alliances refer to those among Japanese small and medium enterprises (SMEs). The object of study of previous chapters is large established firms or their relationships with smaller firms (dealers or suppliers). But there are many SMEs in the Japanese economy. SMEs in manufacturing, defined as firms having less than 300 employees and capitalized at less than ¥100m, constituted more than 99 per cent of establishments in 1986 and the proportion of employees was about three-quarters. Many of them are not subcontractors. Some have escaped from such relationships by diversifying into new areas, while some others may be established SMEs which acquired the entrepreneurial input and entered the right market at the right time. But those firms also face numerous challenges, ranging from human resources and financing to management, marketing, and succession. The chapter describes 'networking' or strategic alliances among progressive SMEs to meet those challenges collectively, especially in an advanced high-tech area, Ota Ward in Tokyo. Whittaker depicts a mixed picture: such alliances meet the needs of SMEs in certain ways, but do not solve their problems entirely. On the whole, giant and large firms still exert strong influences on SMEs.

The next two chapters are by Hideshi Itoh, who interprets the functioning of various Japanese organizational practices in the light of new theoretical advancements in the agency literature, to which he himself has made substantial contributions. Chapter 9, 'Japanese Human Resource Management from the Viewpoint of Incentive Theory', first summarizes some basic stylized facts about human resource management practices and organizational structure of the Japanese firm as described in previous chapters. The primary purpose of this chapter is to examine how those practices may serve to resolve possible incentive problems arising from the unique organizational structure. In the Japanese organizational structure more decision-making is delegated to lower levels of hierarchy, and co-operation among workers in performing tasks becomes more important because of the greater dependency on lateral interactions. Such organizational structure may make job demarcation more ambiguous and the objective assessment of individual performance extremely difficult. As a result, pay by performance in the short run becomes difficult to administer. This is why promotion based upon the long-term association of the workers with the firm becomes a major incentive device at the Japanese firm. From this perspective, Itoh discusses various agency models of promotion and their relevance to the Japanese practices.

The stylized fact analysed in Chapter 10, 'Co-ordination, Specialization, and Incentive in Product Development Organization', is the growing import-