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**THE JAPANESE ECONOMY IN RETROSPECT: SELECTED PAPERS**

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**Volume I**

**Economic History**

**Dedication to:**

**Arlene W. Saxonhouse and Lilly, Noam, and Elena**

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## **Preface and Acknowledgments**

Gary R. Saxonhouse died November 30, 2006 in Seattle, WA, where he was being treated for leukemia. To honor his many accomplishments and writings on the Japanese economy and given our longstanding relationships with him, Hugh Patrick of Columbia University, Gavin Wright of Stanford University, and I decided to assemble the best of his many writings for publication. The selection of his published papers that comprises these two volumes is a testimony and tribute to his lifetime of work and influence that were cut short by his untimely death.

We wish to thank the Committee on Japanese Economic Studies at Columbia University for financial support in assembling these volumes, Arlene Saxonhouse for retrieving many of the papers from her husband's library, Judith Jackson for her untiring effort in helping to track down the published papers, obtaining publisher permissions to reprint them, and retyping and editing several papers, and Yvonne Tan Hui Ling of World Scientific Publishers for handling the publication arrangements.

Robert M. Stern  
Ann Arbor, Michigan  
October 15, 2008

## Chapter 1

### Introduction and Overview

#### Introduction

Gary R. Saxonhouse died November 30, 2006 in Seattle, WA, where he was being treated for leukemia. Born in New York City in 1943, he attended Yale University, where he received his B.A. in 1964 and his PhD in Economics in 1971. He joined the Economics faculty at the University of Michigan beginning in 1970. The selection of his published papers that comprises these two volumes is a testimony and tribute to his remarkable accomplishments and influence that were cut short by his untimely death.

When he began his study of the Japanese economy at Yale in 1966-69, Japan stood out as a unique example of non-Western economic success. But this success was not just a post-1945 phenomenon. Already for the better part of a century, Japanese economic growth had outstripped the performance of every other major economy. Yet, for some time, Japan was viewed almost exclusively as a model of a densely populated, resource-poor economy that other countries in similar circumstances might emulate.

Impressed by Japan's continuing economic success, Saxonhouse began to look for explanations for its economically efficacious adaptation and adoption of technological and managerial paradigms developed elsewhere. In the late 1960s, there was already a large literature in both English and Japanese on Japan's aggregate economic performance. Reasoning that the tools of economic analysis at that time were more useful at the microeconomic level, Saxonhouse decided to focus his research more narrowly on the behavior of Japanese households and individual industries and firms.

His first research analyzed the determinants of productivity change in Japan's cotton textile industry from its earliest days in the 1880s to a point some fifty years later by which time it had come to dominate global markets. As the first important example of Japanese global success and based almost entirely on the assimilation of manufacturing technologies developed in Lancashire and New England, Japan's cotton textile industry deserved close scrutiny. It was fascinating to study because of the availability of a virtually complete production record of each firm in the cotton industry throughout the first five decades of the industry's history. Saxonhouse's econometric analysis based on these virtually unique quantitative materials suggested that the Japanese cotton textile industry's half century leap in economic efficiency rested on its increasing ability to make productive use of a labor force of teen-aged girls whose typical entry rarely stayed more than six months in the industry. The increasing sophistication of the methods employed to make effective use of transient labor went hand in hand with the increasing ability of the Japanese cotton mills to develop ever poorer quality cloth for sale in low income markets throughout the world. Much of this research was first reported in Saxonhouse's doctoral dissertation that was completed at Yale in 1971.

The characteristics of Japan's premier industry during much of the first half of the twentieth century provide an astonishing contrast with what is conventionally assumed to typify Japanese economic behavior. While there was great continuity in Japan's economic performance, it is noteworthy that its economic institutions and economic strategies went through radical change. After becoming known as innovative producers of hitherto unknown low quality but inexpensive versions of conventional machine-made goods, Japan became synonymous with the production of high quality mass-market products. Where once Japan's industrial labor force had the highest recorded turnover rates in economic history, permanent employment became the Japanese norm. And Japan's firms that had once creatively shared information with one another became hermetically sealed by comparison with their overseas counterparts, disclosing little except when required by Japan's government.

The relationships between economic performance and institutional change first identified in Saxonhouse's early studies shaped much of his subsequent research agenda. His interest in making precise comparisons in performance and institutional change over time and over space first led him to an excursion in econometric theory. In the mid-1970s in a series of articles, he developed unbiased, consistent and efficient methods for comparing and explaining differences in parameters estimated from different time periods and from different geographic regions.

In a somewhat different direction, Saxonhouse's interest in how labor-market institutions and outcomes can change over time led him to the study of Korea under Japanese colonial rule. However rapid Japanese economic growth has been since the 1950s, economic growth in Korea has been still more rapid. Despite harsh colonial rule and devastating war, Korea's labor force has come to be totally transformed. An unskilled, indifferent industrial labor force given to high rates of absenteeism became transformed, over the course of the 20th century, into a major Korean asset, known throughout the world for its skill, experience and diligence. This achievement is all the more remarkable because a non-trivial part of this transformation was accomplished while Korea was still under Japanese colonial rule. While the Japanese were perhaps doubtful of its quality, Saxonhouse found that the Japanese learned how to make profitable use of Korean labor. Koreans in turn acquired much of the skills and experience that laid an important part of the foundations for the remarkable post-colonial Korean economic achievements.

Seeking to understand the relationship between economic performance and institutional change using a much larger and more diverse sample of evidence, Saxonhouse and Gavin Wright began in the late 1970s to study the development and migration of the cotton textile industry on a global basis. Relying on the hitherto unexploited records of the English textile machinery makers who equipped most of the world's textile industry, and on published and unpublished reports by Japanese government officials, they sought to document and explain the differing responses around the globe to the challenge of importing and assimilating cotton-textile technologies. Studying the experiences of countries as diverse as China, Japan, Russia, India, the American South, England and Brazil led them to conclude that industrial technology exhibits great malleability in successfully using very different types of labor in different settings on very different terms. Thus, there is an essential indeterminateness to the social implications of industrialization at least so far as the requirements of technology itself are concerned. At the same time, Saxonhouse and Wright were impressed by the continuing effects of institutional

systems, which having been established by human choice run their own course, generating behavior which is often mistaken for entrepreneurial brilliance or perversion.

Having identified Japanese industries operating decades ago with great success using institutions and practices quite different from what later came to be the Japanese norm, by way of comparison, Saxonhouse began in the early 1980s to do more detailed work on the structure and operation of the post-war Japanese economy. Looking first at the development of Japan's biotechnology and machine tool industries, he was struck by how new skill requirements for postwar Japanese industries interacted with Japanese government education policies to create powerful incentives for Japanese firms to maintain permanent employment practices. It is interesting that such incentives were rarely present in early 20<sup>th</sup> century Japan and are largely absent in the United States today.

Permanent employment has made it possible for Japanese firms to overcome the problem posed by the absence of American-style and European-style subsidies for the training of employees outside the workplace. Compared with their overseas counterparts, Japanese firms provide an unusual amount of training for their employees. While solving some problems, the growth of permanent employment as Japan's labor market norm has created new problems not earlier present. Permanent employment, while creating training incentives, undermined many of the incentives that Japanese firms once had for the voluntary exchange of information. In the absence of government intervention, the sharing of seemingly proprietary information, which was so common in Japanese industry decades ago, particularly in the cotton-textile industry, has become a very rare occurrence. Indeed, the Japanese government's sponsorship of large cooperative R&D projects in the private sectors in industries such as machine tools and biotechnology are best understood as important, if very imperfect, efforts to break down the information-flow barriers created by permanent employment practices.

Saxonhouse's research on the Japanese economy in the years following World War II suggests that distinctive Japanese economic institutions are more often than might have been expected imperfect functional substitutes for, and not complements of, practices found in other advanced economies. This is true not only for permanent employment and government-sponsored, cooperative R&D projects, but also for such other well-known Japanese practices as industrial policy. Until very recently the supply of capital had been heavily concentrated in Japan. This concentration, which dates back to the 19<sup>th</sup> century and the emergence of large bank-centered industrial groups, not only made possible, but almost necessitated, a role for the Japanese government in shaping the allocation of capital. Without countervailing Japanese government pressure, and in the absence of market discipline, the complicated pressures of inter-industrial group politics could very well have frustrated economic progress. Japanese industrial policy, while very useful for Japan, therefore appears to address problems not found in the United States and many of the other advanced industrialized economies.

Complementing his research on Japanese industries and institutions, Saxonhouse turned to the study of Japanese trade structure in comparative perspective. He became interested in whether Japan's distinctive economic institutions had a distinctive impact on Japan's trade structure. Given that Japan's manufactured imports had been and remained a relatively small proportion of total imports and of GNP, there was a long standing presumption that Japan's distinctive practices must be having a decisive impact. However, if Japan's economic institutions, while



sometimes different from those abroad, often work in a functionally equivalent way, such a presumption may not be in order.

Saxonhouse noted that economic theory does not dictate that countries with similar per capita GNPs should have manufactured imports that bear more or less the same proportion to total imports, GNP or population. Before such comparisons among advanced industrialized countries can be made, allowance must be made for differences in natural resource endowments, distance from trading partners, and differences in the quantity and quality of labor and capital among other factors. Saxonhouse concluded that in order to make such comparisons in a meaningful way, the theory of comparative advantage had to be applied directly to cross-national data.

Saxonhouse was surprised that applying the theory of comparative advantage proved more challenging than he had first anticipated. While the algebra of the theory of comparative advantage had been long ago worked out by trade theorists, at the time in the early 1980s when he began his research, the actual tests of the theory seemed to make little use of this formal framework. Often the functional forms imposed in these tests could not be derived from comparative advantage mathematics. It appeared that the reluctance to make direct empirical use of the formal framework rested in part on the extreme counterintuitive assumptions required. For example, these included the assumption that wages are everywhere equal throughout the world. By applying a multiplicative errors-in-variable framework which implicitly allows for different qualities of labor, capital and natural resources, Saxonhouse was able to greatly weaken the force of such extreme assumptions, but at the same time to apply the formal theoretical structure in an intellectually rigorous fashion.

The results of his empirical research suggested that when due allowance is made for Japan's distinctive national resources and geography, Japan's trade structure can be almost fully explained. That is, there was little variance left to be explained by Japan's distinctive economic institutions. These results had considerable policy significance. Due to both foreign and domestic political pressure, many of Japan's distinctive economic institutions had undergone significant change. It was therefore a mistake to assume that there was necessarily an intimate connection between such changes and the structure of Japanese trade. Saxonhouse subsequently attempted to deepen this analysis. The traditional theory of comparative advantage rules out economies of scale and assumes each industry produces only one type of good or service. Recent developments in the theory of international trade made it possible to sensibly incorporate both economies of scale and a wide variety of goods being produced by a single industry. These new developments made it possible to explain not only the net exports or net imports of a particular sector but also gross exports and gross imports. Since it was often suggested that Japan's gross trade flows and not its net trade flows were unusual, these developments were highly significant for many of the questions that Saxonhouse had been researching.

In an effort to incorporate these theoretical developments into his research, Saxonhouse was able to show how empirical work can be done using this theory in a way that is entirely faithful to its algebraic structure. He was also able to show how the framework used in his earlier work was a special case of this more general structure. In applying this more general framework to cross-national data, he once again found that Japan's distinctive economic institutions did not appear to have a distinctive impact on Japanese trade structure. Japan's national endowments and

geography explained not only Japan's net trade but also its gross trade. If Japan's distinctive economic practices have an impact, it is through macroeconomic aggregates and not, as generally imagined, at the sectoral level. Both because of its intellectual significance for how Japan's economy is understood and because of its obvious policy importance in understanding Japanese trade structure, interest in a substantial new literature was created.

In the mid-1990s, Saxonhouse began to explore other methods for testing hypotheses about the behavior of Japanese economic institutions. Instead of trying to examine the impact of Japanese economic institutions taken together on Japanese trade structure, he sought to explore the impact of specific government actions such as the creation of joint government-business R&D projects. Here, he examined the impact of such new initiatives on equity markets not only in Japan but also in the United States. Curiously, he found that while Japanese equity markets did not expect that the joint R&D projects would benefit Japanese participants, American equity markets anticipated a negative impact from these projects on their American competitors.

The results for the Japanese and American markets seemed inconsistent with one another. They could be reconciled if the Japanese markets assumed that whatever benefits these firms might receive from participating will be taxed away. Alternatively, the Japanese government already by the mid-1980s was not, if it had ever been, a major source of support for the development of new technologies. Where once government may have signaled the private sector about the direction that incremental investment might take, with financial deregulation and technological maturity this role may no longer have been either possible or necessary. This same technological maturity that makes signaling to the private sector so difficult might also make even a coordinating role for the Japanese government troublesome. Such an interpretation might not seem so surprising at a time of economic stagnation in Japan, but it may well be that American equity markets may take a long time to appreciate that Japanese economic institutions had changed.

In early 2000, Saxonhouse commenced an entirely new line of research focused on Japanese legal institutions. Reworking Japanese and American judicial system data, he discovered, contrary to conventional understanding and notwithstanding the higher probability of conviction in Japan than in the United States, Japanese defendants were more likely to contest their guilt at trial. In attempting to understand how this might happen, he was able to develop a class of models that showed under quite general conditions that the less certain the outcome of trial, the less likely it is that even a risk neutral defendant would go to trial.

Japan is beginning to take steps that may lead to the re-introduction of a jury system last used in any form in the early 1940s. Juries may or may not be better in dealing with facts on average than judges. The very diversity of juries, however, that some say could make them better at evaluating evidence surely introduces a larger variance in the outcome of a trial. This additional uncertainty means that a Japanese judicial system operating with juries will save Japanese resources because fewer cases will go to trial. Counter-intuitively, unpredictable courts are found to be social welfare enhancing. The downside of this unpredictability is that it provides people without valid claims to obtain undeserved payments from defendants. This causes some socially beneficial but risky activities to be foregone solely to limit liability.

Also in 2000, Saxonhouse and Gavin Wright renewed their joint research on global diffusion and adaptation of textile technologies. New developments in computer hardware and software made it possible to conduct analyses on a data set of over 30,000 observations on the more than 30 variables characterizing each machinery order, something that was not feasible previously. This renewed collaboration produced a series of papers showing the relative importance in technological choice of a firm's previous experience with the technology and its alternatives, the current technological frontier, both at home and abroad as seen from the firm's perspective, and the firm's expectations about the movement of this technological frontier based on both domestic and foreign information.

Saxonhouse wrote a number of papers over the years dealing with Japanese macro-financial and exchange rate issues and with Japan-U.S. international economic relations. He co-directed with Robert M. Stern two programs of research in 1999-2004 that were funded by the Japan Foundation's Center for Global Partnership on Japan-U.S. issues and that led to a series of journal and book publications. Of particular interest is a 2005 paper that Saxonhouse wrote on "Good Deflation/Bad Deflation and Japanese Economic Recovery," which looked at issues of Japan's "lost decade" of the 1990s in an historical context.

Saxonhouse's renewed work on the history of the textile industry, together with his longstanding, but hitherto separate interests in international economic relations and labor markets, led him in 2002 to begin to gather materials about and formulate a research design for a project on "The Evolution of Labor Standards in Japan: Human Rights, Scientific Management and International Economic Diplomacy." He received a Guggenheim Fellowship in 2005-06 to pursue this research. He was the keynote speaker in April 2006 at the All-Chicago Conference on Economic History on the topic, "The Evolution of Labor Standards in Japan." However, his illness prevented him from completing this project. During the onset of his illness, he worked also on papers and seminar presentations with Gavin Wright on competing paradigms in spinning technology, "The Integration of Giants into the Global Economy" presented at Yale and published by the American Economic Institute, and "Hachiro Fukuhara, Scholar-Statesman, Ring Spinner, and Industrial Spy?" presented at Northwestern University.

At the University of Michigan, Saxonhouse taught regularly undergraduate and graduate courses on the Japanese economy. He trained many of today's American economists who specialized on Japan as well as a number of Japanese economists and many members of Japan's civil service who were on leave to study at Michigan.

Saxonhouse received many honors for his work, including fellowships from the Guggenheim Foundation, the National Endowment for the Humanities, the Center for Advanced Study in the Behavioral Sciences, and the Institute for Advanced Study. He visited Brown University as the Henry R. Luce Professor of Comparative Development, he received a coveted residency at the Bellagio Center of the Rockefeller Foundation, and was a Distinguished Lecturer at the Northeast Asia Council of the Association of Asian Studies. He was a frequent recipient of the University of Michigan's Faculty Recognition Award and a recipient of the LSA Excellence in Education Award.

Saxonhouse's public service included a member of the senior staff of the U.S. President's Council of Economic Advisers and a consultant for the U.S. Departments of State, Treasury, and Commerce, and the World Bank. He also testified on numerous occasions before Congressional committees and served on advisory panels to the U.S. Congress on the civilian uses of space, industrial competitiveness, and the American economy. In Japan, he was a member of the American advisory board of the Japan Foundation and the academic advisory committee of the Policy Research Institute in the Ministry of Finance.

### **Overview**

The selections of Saxonhouse's published writings have been divided into the following classifications: Economic History; Technology and Innovation; Comparative Advantage, Trade, and Trade Policies; and Macro-Financial Issues and Policies. The selected writings in Economic History are contained in Volume 1, and the other selected writings are contained in Volume 2. The selected writings are only part of the large number of papers that Saxonhouse published during his career, as will be evident from the list of his writings that is contained in an appendix to Volume 2.

In what follows, we have prepared brief summaries of the papers presented below that are designed to assist the reader in identifying the papers that may be of most immediate interest.

### **Economic History**

#### **“A Tale of Technological Diffusion in the Meiji Period,” *Journal of Economic History* 34 (March 1974): 149-165**

This paper describes and analyzes the remarkable uniformity of practice in the Japanese cotton spinning industry, strikingly illustrated by the switch from mules to rings between 1887 and 1888. Whereas economic historians now have well-developed frameworks to explain lags in diffusion and the persistence of older techniques, in this case the transition occurred virtually overnight! Making use of the uniquely rich quantitative record, Saxonhouse estimates a cross-firm production function with shift parameters, and is unable to reject the null hypothesis of technological uniformity. The article attributes this uniformity to institutional arrangements that facilitated the flow of information between firms.

#### **“Country Girls and Communication among Competitors in the Japanese Cotton-Spinning Industry,” in Hugh Patrick (ed.), *Japanese Industrialization and Its Social Consequences*. University of California Press, 1976: 97-125.**

This paper shows that the Japanese cotton textile industry's labor force was predominantly female and short-term, displaying turnover rates that were extremely high by international standards. The typical worker departed after only two years of service, usually without permission. Average experience levels increased over time, not because turnover behavior changed, but because a small group from each cohort stayed longer, gradually accumulating a core of experience over time. A production function estimate shows that worker experience had a significant impact on productivity. The paper explains this apparent managerial failure by

appealing to the high degree of technical uniformity within the industry, making it difficult for any one employer to recoup the costs of investment in the human capital of their workers.

**“Productivity Change and Labor Absorption in Japanese Cotton Spinning, 1891-1935,”**  
*Quarterly Journal of Economics* 91 (May 1977): 195-219.

Using an innovative econometric procedure and drawing on abundant historical data, this paper develops an account of technological change and productivity growth in Japanese textiles during the era of its rise to world leadership in this industry. The basic strategy is to treat the parameters of the conventional production function as conditional on nonconventional inputs. Changes in these parameters are shown to account for most observed productivity change, with biases that shifted across historical phases. [Saxonhouse expounded this methodology more formally in “Regressions Using Samples Having Different Characteristics,” *Review of Economics and Statistics* 59 (May 1977): 234-237.] Remarkably, relatively modest changes in worker experience, primary education, and length of shift account for the very large growth in productivity over the period.

**“Working Koreans in Korea and Japan in the Interwar Period,”** Japanese translation in T. Nakamura (ed.), *Senkanki No Nihon Keizai Bunseki*, Tokyo: Yamakawa Shuppan Sha, 1980, pp. 356-398.

Previously published only in Japanese, this paper asks the extent to which the bases for modern Korean growth lay in the interwar period of Japanese occupation. One of the paper’s main data sources is a comprehensive 1940 census of the Korean population, previously thought to have survived only in truncated form. A complete copy was discovered by Saxonhouse in 1978 in the Population Studies Center at the University of Michigan. On the basis of this evidence, the paper shows that the Korean industrial labor force did not in fact decline between 1930 and 1940, as official data appear to show. The paper then elaborates an econometric production-function framework, in which management quality can be identified separately from worker quality by nationality. The results show that the quality of Korean-managed firms improved markedly between 1914 and 1928, though they remained somewhat behind the Japanese. The elasticity of substitution between Japanese and Korean workers also increased over time, as Japanese managers became less prejudiced and better able to make productive use of Koreans.

**“Two Forms of Cheap Labor in Textile History,”** with Gavin Wright, in Gary R. Saxonhouse and Gavin Wright (eds.), *Technique, Spirit and Form: The Making of Modern Economies*, Supplement 3 to *Research in Economic History*. Greenwich, CT: JAI Press, 1984, 3-31.

The early New England textile industry featured two alternative organizational forms: the *Waltham* system in which young women lived in dormitories while working in the mills for a brief period of their lives; and the *Rhode Island* or *Slater* system of company-supplied housing and employment on a family basis. In the two great triumphs of cheap-labor competitors in the next phase of textiles history, Japan emulated Waltham while the U.S. South followed Slater. This paper analyzes the causes and consequences of these choices. The first section interprets the initial choices as rational responses to conditions of labor supply, specifically the degree of labor-market development and security of farm tenure. Subsequent sections argue that once in

place, each system had its own internal evolutionary logic, generating very different patterns of job assignments, wage trajectories, and skill development over time. The larger point is the malleability of industrial technology in its use of various types of labor.

**“Rings and Mules Around the World: A Comparative Study in Technological Choice,”** (with Gavin Wright), in Gary R. Saxonhouse and Gavin Wright (eds.), *Technique, Spirit and Form in the Making of the Modern Economies: Essays in Honor of William N. Parker. Research in Economic History, Supplement 3: 271-300.* JAI Press, 1984. [A shortened version of this essay appeared as “Technology Choice in Cotton Textile Manufacturing,” in Kazuchi Ohkawa and Gustav Ranis (eds.), *Japan and the Developing Countries: 212-235.*]

This paper considers the decisions by textile firms to adopt ring versus mule spinning machines between the 1870s and the 1930s. Drawing on newly developed data from the records of British textile machinery firms, the authors are able to move the discussion beyond purely binational comparisons (British vs. American, Japan vs. India) to track adoption decisions in many countries around the world. Whereas British firms have been criticized for technological conservatism, the paper shows that the demand for mules was strong in many other countries before World War I, including France, Germany, India, Russia, and Canada. The paper argues that a country’s initial choice was closely related to the quality of domestic cotton fibers, the mule being the preferred choice for spinning short-staple Asian cottons. The British equivalent was the proximity of highly developed markets in raw cotton and yarn, for which the highly flexible mule was well adapted.

**“New Evidence on the Stubborn English Mule and the Cotton Industry, 1878-1920,”** with Gavin Wright, *Economic History Review* 37:4, pp. 507-19, November 1984.

Thus paper deploys the evidence on sales of British textile machinery to address the debate over Britain’s delay in switching from the mule to the ring. The new data show that the British preference for the mule extended to low-count as well as high-count yarns, and hence cannot be explained as a simple consequence of product composition. The authors go on to argue that these choices were not “constrained” by the industry’s industrial structure, because many new firms entered during the boom years 1900-1907, freely choosing both vertical specialization and the mule. Instead, these choices reflected a positive belief in the superiority of the mule on the part of the British technological community, which did not foresee its obsolescence as of the 1920s.

**“Stubborn Mules and Vertical Integration: The Disappearing Constraint?,”** with Gavin Wright, *Economic History Review*, 40:1, February 1987, 87-94.

This note responds to a critique by William Lazonick [“Stubborn Mules: Some Comments,” *Economic History Review* 40 (1987), 80-86], restating his view that British preference for the mule reflected constraints associated with vertical specialization. The authors respond that the term “constraint” seems to have no objective meaning in this usage. In their view, Lancashire’s positive preference for both vertical specialization and the mule is confirmed by its indifference towards rings equipped with paper tubes instead of wooden bobbins, an innovation whose sole purpose was adapting ring spinning to a vertically-specialized structure. The authors conclude by calling again for a multilateral comparative approach.

**“Technology Choice and the Quality Dimension in the Japanese Cotton Textile Industry,” with Gustav Ranis, in Kazuchi Ohkawa and Gustav Ranis (eds.), *Japan and the Developing Countries*. Oxford: Basil Blackwell, 1985, 156-76.**

This paper considers tradeoffs among dimensions of cloth quality and their relationships to varying scarcity and quality of productive inputs, in the Japanese cotton textile industry between 1906 and 1935. The authors begin by estimating implicit prices for fifteen attributes of yarn and cloth, using a hedonic price regression. They proceed to estimate derived product-attribute supply functions and derived input-demand functions. The main general conclusion is that lower product quality was strongly associated with more labor intensive production methods. Increased formal education, in contrast, was associated with higher product quality and increased use of American raw cotton. The commercial success of the industry reflected the creative exploration of these complementarity and substitution possibilities.

**“Supply and Demand for Quality Workers in Cotton Spinning in Japan and India” (with Yukihiro Kiyokawa), in Kazuchi Ohkawa and Gustav Ranis (eds.), *Japan and the Developing Countries*. Basil Blackwell, 1985: 177-211.**

This paper presents a systematic comparison of labor force and working conditions for Indian and Japanese cotton spinning firms, between the 1890s and the 1930s. The Japanese data are richer, based on a unique, nearly-universal 1997 survey, allowing the estimation of a wage-determination system of supply and demand equations. [These results were first presented in Saxonhouse, “The Supply of Quality Workers and the Demand for Quality in Jobs in Japan’s Early Industrialization,” *Explorations in Economic History* 15 (1978), 40-68.] The analysis shows that Japanese workers chose jobs for both pecuniary and non-pecuniary reasons. Poorer, less stable workers cared mainly about money wages, while older, more experienced workers were willing to trade off money wages for a shorter workweek and better dormitory life (but not, apparently, for lower mortality rates). The Indian data reflect an entirely different pattern: mostly male, less productive, loosely supervised, with high rates of absenteeism. The authors conclude: “It is evident that the acquisition of a mature, stable labor force does not necessarily result in industrial success.”

**“Determinants of Technology Choice: The Indian and Japanese Cotton Industries,” with Gustav Ranis, in Kazuchi Ohkawa and Gustav Ranis (eds.), *Japan and the Developing Countries*. Oxford: Basil Blackwell, 1985, 135-55.**

The Indian and Japanese cotton textile industries had substantially similar conditions at the beginning of the 1880s, but Japanese production, productivity, and exports grew much more rapidly in subsequent decades. This paper analyzes the contrast, emphasizing the Japanese industry’s success in adapting technology, work organization and product mix to a labor-abundant setting. For example, Japanese mills employed primarily females and ran two shifts, whereas Indian mills used mainly males and ran only a single shift. In the 1890s, the Japanese adopted ring spinning technology complemented with labor-intensive cotton-mixing processes, while the Indians were slow to switch from the mule to the ring. The paper discusses likely reasons for India’s lag, including restraints on entry, consumer demand for finer-count yarns, the management-agency system, and reliance on British advice.

**“Mechanisms for Technology Transfer in Japanese Economic History,” *Managerial and Decision Economics* 12:2, Winter 1991, 83-92.**

This paper considers the institutional bases for inter-firm technology transfer in the Japanese cotton textile industry, before and after World War I. Prior to the war, a remarkable uniformity prevailed in technology and practice, maintained by explicit inter-firm cooperation through the industry association (*Bōren*) and/or the engineering staff of Platt Brothers, the chief supplier of textile machinery. These mechanisms declined during the interwar period, but inter-firm technological cooperation was nonetheless supported by informal cooperation among professionally-oriented textile engineers, participants in an extremely active labor market for technical personnel. This was in marked contrast to the postwar permanent employment system.

**“Structural Change and Japanese Economic History: Will the 21st Century Be Different?” *American Economic Review* 88:2, Papers and Proceedings, May 1998, 408-11.**

This paper presents a broad overview of the bases for Japan’s high-growth performance in the twentieth century. Rapid accumulation of human capital was an important early factor, improving the country’s ability to absorb technologies from abroad, and subsequently to generate new technologies domestically. Japan’s institutional arrangements, contrary to widespread impressions abroad, have been continually changing and adapting throughout the century. The distinctive postwar system, featuring bank-oriented financial control, permanent employment, and government-sponsored industrial policy, was very different from earlier forms, and changed substantially after 1973. Thus, Japan’s growth record should not be attributed to any one configuration of its economic institutions.

**“Technological Evolution in Cotton Spinning, 1878-1933,” with Gavin Wright, in D. Farnie and D. Jeremy (eds.), *The Fibre that Changed the World*. Oxford: Oxford University Press, 2004, pp. 129-52.**

This paper returns to the issue of rings versus mules, with a more complete global data set derived from the British textile-machinery company records. The authors observe that the earlier debate focused on rationalizing choices between the two techniques, but not on the evolution of the underlying technologies. The new data allow such a study, based on the detailed technical specifications found in the orders, including such variables as: machine size, speed, yarn count, twist versus weft, and the cotton varieties for which the machine was suited. The evidence presented shows that both rings and mules advanced in size and speed between 1878 and 1914, with no decisive performance difference between them. The ring gained market share over time, however, by expanding the range of its capability, as measured by the yarn count for which the machine was designed. The most rapid increases in yarn counts occurred in Japan and Mexico, where progress in machine manufacture complemented improvements in labor quality and management.

**“How Japan First Began to Export Machine-Made Manufactures to East Asia,” *Japan Economic Review* 56:4, December 2005, 431-40.**

This paper analyzes inter-firm differences in export activity, using data from the cotton industry at the turn of the 20<sup>th</sup> century. The first shipment of cotton yarn to China occurred only in 1890, and at that time the subject of export trade was considered an appropriate matter for industry-



wide discussion and collective action. The difficulty in arriving at a common position is illuminated by the discrete choice model estimated in the paper, which shows that firm-level variables (size, yarn quality, age of capital stock) had significant effects on the firm's propensity to export. These results suggest that sunk costs of trading constituted an important barrier to deep regional economic integration.

**“Hachirō Fukuhara, The Scholar-Statesman, Ring Spinner, and Industrial Spy?” April 2006, unpublished.**

Originally, delivered as an address to the Sixth Annual Kyoto Conference on Japanese Studies, this paper presents an account of the activities of Hachiro Fukuhara, who served from 1901 to 1903 as the Special Agent of Japan's Ministry of Agriculture and Commerce in the United States. Fukuhara made detailed studies of the American textile industry, including many visits to machine shops to gain knowledge that might foster Japanese production of textiles machinery. The project took an unexpected turn, however, when Fukuhara took an eight-month position as a ring spinner at the Durham Cotton Mill in North Carolina (obtained through the intervention of Benjamin Duke, whose family owned the cotton mill in addition to their tobacco operations). As a result of his observations, Fukuhara recommended that the Japanese industry adopt the family-based mill-village system then in use in the American South. This unrealistic recommendation had no success in Japan. But the paper uses the detailed production data gathered by Fukuhara to show that within five years of his report, the Japanese industry virtually matched the productivity performance of the U.S. mills.

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**THE JAPANESE ECONOMY IN RETROSPECT: SELECTED PAPERS**

**BY GARY R. SAXONHOUSE**

**Editors**

**Robert M. Stern, Gavin Wright, and Hugh Patrick**

**Volume II**

**Technology and Innovation**

**Comparative Advantage, Trade, and Trade Policies**

**Macro-Financial, Issues and Policies**

**Dedication to:**

**Arlene W. Saxonhouse and Lilly, Noam, and Elena**

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## **Preface and Acknowledgments**

Gary R. Saxonhouse died November 30, 2006 in Seattle, WA, where he was being treated for leukemia. To honor his many accomplishments and writings on the Japanese economy and given our longstanding relationships with him, Hugh Patrick of Columbia University, Gavin Wright of Stanford University, and I decided to assemble the best of his many writings for publication. The selection of his published papers that comprises these two volumes is a testimony and tribute to his lifetime of work and influence that were cut short by his untimely death.

We wish to thank the Committee on Japanese Studies at Columbia University for financial support in assembling these volumes, Arlene Saxonhouse for retrieving many of the papers from her husband's library, Judith Jackson for her untiring effort in helping to track down the published papers, obtaining publisher permissions to reprint them, and editing and retyping some of the papers, and Yvonne Tan Hui Ling of World Scientific Publishers for handling the publication arrangements.

Robert M. Stern  
Ann Arbor, Michigan  
October 15, 2008

## Chapter 1

### Introduction and Overview

#### Introduction

The papers contained in Volume 1 deal with various facets of Japan's economic history, including especially Japan's development of its domestic textile industry following the Meiji period in the 19<sup>th</sup> century. The papers in this Volume 2 cover topics in Japanese technological development and innovation, Japan's comparative advantage, trade, and trade policies, and Japanese macro/financial issues and policies. Saxonhouse's curriculum vitae is also included.

#### Overview

##### A. Technology and Innovation

**“Industrial Restructuring in Japan,”** *Journal of Japanese Studies*, Summer 1979, pp. 273-319. Reprinted in D. Okimoto and T. Rohlen (eds.), *Inside the Japanese System: Studies in Society and Political Economy*, Stanford, CA: Stanford University Press, 1988.

Japan experienced dramatic structural adjustment between 1955 and the early 1970s in response to internal changes that were occurring. Successful Japanese industrial performance and Japanese thriftiness changed Japan to a capital-rich country. Individuals who were the product of Japan's already comprehensive educational opportunity were given the opportunity to gain relevant industrial experience and thereby changed Japan to a skill-rich economy. However, high energy prices, slow growth, yen appreciation, and competition from less developed countries had a profound impact on Japanese industrial structure in the second half of the 1970s. It is noteworthy that there was substantial sectoral variation across Japanese industries, with some sectors performing well and others experiencing stressful adjustment. The Japanese government introduced a number of policies to deal with its depressed industries in an effort to mitigate the adjustment problems being experienced.

**“What Is All This About ‘Industrial Targeting’ in Japan?”** *The World Economy* 6:3, September 1983, 253-74.

In examining the various instruments of industrial policy, Saxonhouse notes that Japan gives less formal assistance to its high-technology sectors as compared to most other advanced industrialized countries. Targeting is largely reserved for Japanese agriculture. Japan's high-profile government intervention is best understood as a response to Japan's distinctive institutions as a means of accumulating capital and labor skills. Japan's industrial policy should be viewed accordingly as an effort to overcome the distortions resulting from the absence of well developed capital markets. In this same light, Japan's government-sponsored cooperative R&D projects should be understood as an effort to insure that the barriers to informal inter-firm transfer of information created by Japanese employment practices does not slow down the pace of technology diffusion within Japan. Saxonhouse concludes that there is nothing abnormal about Japan's trade and industrial patterns. Japan's high-profile but mostly informal industrial policy should thus be viewed as a means of addressing the drawbacks of its financial system.



**“Biotechnology in Japan: Industrial Policy and Factor Market Distortions,”** *Prometheus* 3:2, December 1985, 277-314.

There is a widespread feeling that the Japanese government is unfairly acquiring for its economy the few really good tickets to prosperity in the twenty-first century. Foreign reactions to Japanese targeting have ranged from concern that such practices are unfair and inconsistent with the international economic system and that Japan should be forced to eliminate them, to intense admiration and a hope the other countries can somehow emulate Japan. Understanding Japanese practices, particularly as they relate to high technology industries, requires an analysis not only of the relationships between government and business in Japan, but also of the relationships between government and education and between education and business. From the perspective of an analysis of the inter-relationships between these institutions, it is possible to understand the character of the market distortions and market failures with which Japanese policy has sought to cope. It should also then be possible to assess whether other countries face a similar set of problems requiring similar interventions. These analyses will proceed with particular focus on the development of the biotechnology industry in Japan and the United States.

**“Industrial Policy and Factor Markets: Biotechnology in Japan and the United States,”** in H. Patrick (ed.), *Japan’s High Technology Industries*. Seattle: University of Washington Press, 1986, 97-135.

This paper discusses Japanese government policy to develop the biotechnology industry, considering the industrial policy tools of trade policy (tariffs, which were low), product standards, government subsidies and grants, tax policy, capital availability, regulation of market structure, and funding (the lack of a Japanese venture capital market). The basic conclusion is that the Japanese government was giving “less financial aid and comfort to its high technology sectors and to biotechnology in particular than do the governments of most other advanced industrialized economies,” including the United States.

**“Technology and the Future of the Economy,”** in K. Yamamura and Y. Yasuba (eds.), *The Political Economy of Japan, Volume 1: The Domestic Transformation*. Stanford, CA: Stanford University Press, 1987, pp. 385-419.

This paper focuses on Japan’s R&D system, and discusses three ways in which it is different from the U.S. system: the larger role of small companies in Japan; the (limited) role of the Japanese government in R&D funding; and the advanced training for technical personnel located more in firms than educational institutions. It has tables with comparative data on productivity change, and patenting, and it discusses differences in government policies, corporate environments, and organizational structures.

**“Technological Progress and R&D Systems in Japan and the United States,”** in Cecil H. Uyehara (ed.), *U.S.-Japan Science and Technology Exchange: Patterns of Interdependence*. Boulder, CO: Westview Press, 1988, 29-54.

This paper notes that Japan’s technological progress in the period under study has outstripped the performance of all the other advanced industrialized economies. Japan’s technological success was built on a rapid increase in its commitment of resources to R&D. Differing fiscal choices made in Japan and in the United States have shaped the R&D systems in both countries.

Japanese firms have played a critical role in the training of scientists and engineers in contrast to the U.S. economy's pervasive extra-firm training programs and market allocation of experienced personnel. As a consequence, in the United States, large amounts of potentially proprietary and technological information readily become global public goods. Japanese government science and technology policy has been designed to ensure that the barriers to inter-firm transfer of information created by Japanese employment practices do not slow the pace of technology diffusion within Japan.

**“Japanese High Technology, Government Policy, and Evolving Comparative Advantage in Goods and Services,”** in V. Canto and K. Dietrich (eds.), *Industrial Policy and International Trade*. Greenwich, CT: JAI Press, 1992, 139-66.

This paper develops and expands Saxonhouse's earlier published discussion of the role of Japanese industrial policy as a way of dealing with imperfect and rigid capital and labor markets. It discusses (briefly) the governments' comparative research programs for VLSI electronic chips and other areas, and their various difficulties. The appendix presents the formal framework of his Heckscher-Ohlin-Samuelson (H-O-S) model that is extended to technological services as well as goods.

**“Optoelectronics in Japan: A Market Evaluation of Government High-Technology Policy,”** *Managerial and Decision Economics* 18:2, March 1997, 177-193.

Insofar as aggregate fiscal support is concerned, there appears to be little basis for the view firmly expressed by U.S. optoelectronic firms that Japanese government financial aid has played a critical role in the development of Japanese optoelectronics. Direct grants and tax expenditures in Japan over a 15-year period are less than what the U.S. government provides to the American industry in a single year. While over 90% of U.S. funding is defense-related, much of this funding appears to have direct commercial relevance. The Japanese optoelectronics industry finds MITI's role as marginal at best and more likely a nuisance. Japanese assistance does not have a significant impact on equity prices, whereas American equity values have a strong and significant negative impact. Japan has reached a point of technological maturity such that even signaling to the private sector is troublesome.

**“Technological and Information Transfer: How do Some Nations Learn what Other Nations Know? Japan's Experience,”** *Pacific Review* 12:2, 1999, 223-45.

The returns to the rapid acceleration in the growth of GDP per capita in the past century and a quarter have been very inequitably distributed across nations. Nations that were already relatively wealthy in 1870 have received most of the benefits of this increase in material well-being. Japan is thus far the only major example of a country that has been able to fully traverse the vast gulf that separates poorer from wealthier nations. Lately other economies in East Asia have experienced such sustained high rates of growth in GDP per capita as to suggest they too will join Japan as non-Western examples of the world's wealthiest nations. Some doubt has been cast on these optimistic projections by findings that economies such as Taiwan and Korea have grown rapidly, seemingly Soviet-bloc style, without the benefit of rapid growth in total factor productivity (TFP) change. Characterizing growth without TFP change as Stalinist, however, is ahistorical. The United States, the United Kingdom and Japan among other nations, all

experienced long periods of rapid growth in per capita GDP without simultaneously experiencing rapid increases in TFP. In each instance, such phases were succeeded by periods where per capita GDP growth was increasingly augmented by improvements in TFP.

One puzzle here is that the periods characterized by little TFP change do appear to be times when substantial technological improvement was taking place. In the case of the United States, there is considerable evidence that the extraordinary increases in factor accumulation were driven by what appear to be substantial advances in technology. A case study of the cotton textile industry suggests much the same may have been true in Japan. The character of the product markets and the factor markets faced by the Japanese cotton-spinning industry in the Meiji period created an environment within which technological adaptation and innovation came to be a network phenomenon with the industry's trade association and the industry's prime machinery supplier serving as a critical link. Later with product market and credit market changes, the role these institutions played diminished to be replaced by information transfers that were the by-product of a very well-functioning market in experienced, and by the standards of other nations, very well-educated textile engineers.

In the half-century after 1945, the rise of permanent employment practices in Japan has created barriers to information flows and collective technological innovation and adaptation that were so much a part of the experience of Japan's leading industry in the early 20th century. Curiously, this is just the time when TFP change has become an important component of Japan's very rapid growth in per capita GDP. The past half-century has also been a time when the Japanese government has been actively involved in attempting to shape industrial structure in an otherwise market-based economy. One set of policy instruments that has attracted particular attention overseas has been government-sponsored R&D consortia. These consortia can be thought of as government programs designed to break down the walls preventing information flows among Japanese firms. Japan's cooperative R&D projects can be thought of as ways to capture some of the benefits of American-style and pre-war Japanese-style labor markets, even while continuing to avoid some of the costs associated with relatively high labor mobility. There is great disagreement as to the efficacy of these Japanese government programs, with overseas firms looking enviously at projects that Japanese industry sees as having only minor significance or worse. A study of the impact of two Japanese government-sponsored opto-electronics projects on Japanese and American equity markets confirms these differing perceptions, confirms that the speed with which information diffuses back from Japan to the United States has increased substantially over the past decade, but does not suggest which of the two differing perceptions is correct. Knowledge-based growth may have proceeded this last half-century in Japan with less inter-firm diffusion of technology than was characteristic at some points earlier in Japan's history.

In the very late 20th century, changes in global markets and the uncertainty of life close to the technological frontier are forcing changes in Japanese institutions. Japanese firms of the future may prefer to have their labor force bear more both of the risks associated with specialized training and the risks associated with secular and cyclical demand shocks. Much as Japan's labor force did early in the 20<sup>th</sup> century, such steps will require a change in the way in which training is provided and changes in the Japanese government's educational and social policies. At the same time, the type of information-flow problems the government-sponsored R&D consortia were once designed to address may well be as insignificant in the future as they once may have been in Japan's past. In contrast, the type of institutions supporting technological diffusion in

Japan's textile industry in the 1920s and early 1930s may be part of Japan's future. On the basis of the evidence presented here, the answer to the question whether Taiwan, Korea and other East and Southeast Asian countries seeking to follow Japan's full transition to very high standards of material well-being and knowledge-based growth should avoid or emulate Japan's institutional set-up of the past half-century is not at all obvious.

**“R&D Consortia, News, and Japanese High-Technology Policy: Optoelectronics in Japan,” in M. Aoki and G.R. Saxonhouse (eds.), *Finance, Development, and Competition in Japan*. Oxford: Oxford University Press, 2000, pp. 212-38.**

This is the last of Saxonhouse's high-tech series of papers. It begins with a prologue of how and why the United States in 1993 suddenly and dramatically changed its trade policy towards R&D subsidies in the Uruguay Round negotiations. Saxonhouse then uses the development of the optoelectronics industry in Japan as a case study in Japanese industrial policy. He points out that the U.S. government did far more than did Japan to promote the U.S. optoelectronics industry. He traces the Japanese government's role in some detail, considering the standard policy instruments, including: funding; tax policy; and especially government-sponsored research consortia (in which the government's role was marginal at best). He carries out an event study of the equity performance of Japanese and American optoelectronic firms, laying out the equation system to specify his estimates.

## **B. Comparative Advantage, Trade, and Trade Policies**

**“Evolving Comparative Advantage and Japan's Imports of Manufactures,” in K. Yamamura (ed.), *Policy and Trade Issues of the Japanese Economy*. Seattle: University of Washington Press, 1982, pp. 239-69.**

It was often maintained that the comparatively small ratio of Japan's imports of manufactures to total imports was evidence of Japan's restrictive trade policy. In response to domestic and international pressures, there was an acceleration of the liberalization of Japan's trade policies in the early 1970s. Nonetheless, Japan's import ratio remained well below the levels for other advanced economies. Using the framework of the Heckscher-Ohlin-Samuelson model for estimation purposes, Saxonhouse concludes that special undefined Japanese characteristics or particular foreign failures in the Japanese market do not play a central role in explaining the postwar pattern of Japan's trade. He argues that his results suggest that the commercial policy and attitudinal changes of the 1970s did not greatly alter the structure of Japan's imports. This was not because of foreign cultural insensitivity to Japan, but because Japan's policies involved only relatively small distortions. When the differing quantity and quality of Japanese labor, capital, natural resources, and distance are properly given their full allowance, the Japanese share of manufactures in total imports is comparable to European and American experiences.

**“The Micro- and Macroeconomics of Foreign Sales to Japan,” in W. Cline (ed.), *Trade Policy in the 1980s*. Washington, D.C.: Institute for International Economics, 1983, pp. 259-304.**

Saxonhouse notes that it is widely believed that foreign access to the Japanese home market has been tightly controlled. This belief has such widespread credence that it may come as a shock

when he documents that the traditional indices of the international economic system suggest that foreign access to the Japanese market would have to be considered excellent. Yet the question remains that Japan's imports of manufactured goods appear low by conventional indices and as a percentage of GDP. In this connection, Saxonhouse stresses the distinctive endowments of the Japanese economy that have shaped its trade structure, and, in this light, Japan does not differ appreciably in foreign access as compared to other advanced economies. He further argues that the removal of Japan's illiberal trade barriers would have a negligible impact on Japan's persistent current account surplus. He notes, however, that there may be scope for the liberalization of Japanese agricultural policies and the capital movements.

**“Services in the Japanese Economy,” in R. Inman (ed.), *Managing the Service Economy*. Cambridge: Cambridge University Press, 1985, pp. 53-83**

Saxonhouse reviews the performance and role of Japan's services sector in the pre-1945 period. He next considers the first four decades of the postwar period, including an assessment of the future growth and productivity performance of Japan's services and their relation to the future growth and productivity performance of the Japanese economy as a whole. He then examines Japan's service industries in a comparative context, in particular Japan's distribution system and the distinctively small exports of technology services. Saxonhouse concludes that the development of Japan's services sector is remarkably consistent with international patterns. The rapid changes in services that have occurred reflect the rapid changes in the economy as a whole, stemming in particular from the growth in Japan's aggregate capital stock and improvement in the quality of Japanese labor and the education embodied in that labor.

**“Comparative Advantage, Structural Adaptation, and Japanese Performance,” in T. Inoguchi and D. Okimoto (eds.), *The Political Economy of Japan, Volume 2: The Changing International Context*. Stanford: Stanford University Press, 1988, pp. 225-48.**

This paper reviews the role of structural change in the economic performance of the advanced industrialized economies, with a particular focus on Japan. A significant question is whether the international commercial relations of the advanced economies will become more or less important as a source of structural change compared to the first four decades after WWII. Japan's rapid growth after WWII was accompanied by dramatic shifts in the allocation of resources, but there are several other countries that had similar experiences of structural change, such as Italy and Korea. Saxonhouse develops an empirical framework to explain how the growth of domestic resources may alter the trade structure and how trade may affect the reallocation of resources. He shows that the major industrialized economies have become increasingly integrated since WWII as a force for inducing structural change. He reviews finally the distinctive characteristics of Japanese institutions as the basis for Japan's economic success and takes issue with the pressures being brought to bear to harmonize these institutions along the lines of other major economies.

**“An Analytical Survey of Formal and Informal Barriers to International Trade and Investment in the United States, Canada, and Japan,”** with R. M. Stern, in R. M. Stern (ed.), *Trade and Investment Relations Among the United States, Canada, and Japan*. Chicago: University of Chicago Press, 1989, pp. 293-353.

This paper lists the major categories of nontariff measures and related policies that are widely used, and distinctions are drawn between formal and informal barriers and their rationale and possible consequences, with a focus on the United States, Canada, and Japan. There is a discussion of the conceptual issues involved in measuring the barriers. The major empirical efforts undertaken to estimate the extent to which Japan’s barriers set it apart from the United States, Canada, and other major countries are reviewed and some new results are presented. The model used for estimation purposes is set out in a Technical Appendix. The conclusion of the paper is that there is not much evidence for the contention that Japan relies on a variety of informal barriers to influence the structure of its trade. Further, when cross-national differences in factor endowments are taken into account, Japan’s trade structure does not appear distinctive relative to other major countries. The evidence on foreign direct investment was inconclusive.

**“Economic Growth and Trade Relations: Japanese Performance in Long-Term Perspective,”** in Anne Krueger and Takatoshi. Ito (eds.), *Trade and Protectionism*. Chicago: University of Chicago Press, 1993, pp. 149-79.

Japanese trade structure has been historically distinguished by a low level of manufacturing exports, a pattern widely attributed to protectionist distortions of comparative advantage. This paper argues that the pattern is better understood as a consequence of Japan’s unusual factor endowments (low natural resources, high-quality labor) and high savings rates, compared to other advanced countries of the world. Elsewhere indices of intraindustry trade have been high and rising; this has not been true of Japan, whose trade with other advanced countries has been largely “difference-based” (and hence subject to political opposition abroad). Extending his 1989 study noted above, Saxonhouse develops a “factor-endowment-based theory of intraindustry trade,” and proceeds to estimation of intraindustry trade equations and import share equations for a sample of 24 economies in 1983. The results show that Japanese trade structure can be captured within tolerance intervals generated without Japanese observations. This finding is consistent with Saxonhouse’s earlier study by showing that the result holds even when the sample is restricted to high-income, relatively open countries.

**“What Does Japanese Trade Structure Tell Us About Japanese Trade Policy?”** *Journal of Economic Perspectives* 7:3, Summer 1993, 21-43.

Saxonhouse notes that economic research provides little evidence that Japan’s trade regime is different. Yet it is widely believed that Japan engages in unfair trade practices on a broad scale. He further points out that Japan’s productivity growth and structural transformation have outstripped every other major industrialized economy in the second half of the 20<sup>th</sup> century. This is not an accident, and it rests on Japan’s long history of growth and structural change prior to its opening to trade in the 19<sup>th</sup> century. He stresses that Japan’s geography differs greatly from other major countries. Its poor endowment of natural resources has been combined with a high quality labor force and unusually thrifty households. These circumstances thus can help to explain Japan’s relatively low level of manufactured goods imports and its limited participation in intra-industry trade. Neither the price behavior of Japanese firms nor the pattern and volume

of Japan's trade suggests that its trade regime is different. Some of Japan's economic institutions may be distinctive, but there is little evidence that they produce outcomes that distort the international economic system.

**“Pricing Strategies and Trading Blocs in East Asia,” in J. Frankel and M. Kahler (eds.), *Regionalism and Rivalry: Japan and the U.S. in Pacific Asia*. Chicago: University of Chicago Press, 1993, pp. 89-119.**

Saxonhouse first reviews the consequences of trading bloc formation for countries left outside such blocs, stressing the downside for such countries. He notes that bloc members may have no incentive to admit new members, except when the formation of a rival bloc is threatened. This is the situation facing East Asian economies whose welfare may be damaged by blocs formed elsewhere. He next reviews the prospects for a regional trade regime in East Asia. Based on estimates of a factor-endowment based version of a gravity model of intra-industry trade, he concludes that there is no bias in the trading patterns of the leading East Asian economies and therefore no evidence that a rival trading bloc is being formed in East Asia in response to developments in Europe and North America. Finally, he examines the exchange rate-induced pricing strategies of East Asian firms across East Asian markets, finding evidence of country-specific pricing strategies in these markets and apparent existence of remaining trade barriers. This suggests that region-wide liberalization could still be of benefit to the East Asian economies.

**“Do Japanese Firms Price Discriminate in North America?” *World Economy* 17:1, January 1994, 87-99.**

This paper addresses issues of market power and export pricing. Saxonhouse sets up equations to estimate strategic pricing behavior for Japanese exports to Canada, the United States, and Mexico (NAFTA) for 41 product lines. He estimates the coefficients for nominal and real exchange rate changes and finds evidence of Japanese strategic pricing. He then tests hypotheses as to whether Japanese strategic pricing varied among the NAFTA markets, and he concludes that it did.

**“A Short Summary of the Long History of Unfair Trade Allegations Against Japan,” in J. Bhagwati and R. Hudec (eds.), *Fair Trade and Harmonization*. Cambridge, MA: MIT Press, 1996, 471-513.**

This is a comprehensive overview paper that is especially strong in its analysis and judgments on the issues. It discusses at some length foreign (essentially only American) perceptions of Japan's unfair institutions and behavior, in particular eleven illiberal Japanese institutions discussed by Saxonhouse in his earlier research and updated here. Saxonhouse considers such important topics as the saving-investment imbalance, land use, keiretsus, the distribution system, exclusionary business expectations, and the evolution of the Structural Impediments Initiative (SII) talks undertaken in connection with the early Clinton administration trade policies after 1992. Saxonhouse concludes that the variety of complaints against Japan may end as the result of Japan's slowing economic growth. The maturation of Japan's economy suggests that it will impose no more unwanted structural changes on its trading partners than the median advanced

industrialized economy and therefore Japan's participation in the international economic system will finally be fully accepted.

**“How to Explain Japan's Legal System,”** *American Law and Economics Review*, 3:2, September 2001, 363-84.

While ostensibly a book review, this paper is substantively and significantly more than a review. In their 1999 book, *Japanese Law: An Economic Approach*, published by the University of Chicago Press, J. Mark Ramseyer and Minoru Nakazato find some functional similarities, but also significant differences between Japanese and U.S. federal legal procedures, notably that “Japanese criminal defendants are loath to go to trial and that Japanese prosecutors are badly overworked.” Saxonhouse develops and uses U.S. state data to show that these apparent differences in Japanese and U.S. legal procedures are not borne out in the data.

### C. Macro-Financial Issues and Policies

**“Equity Markets, Political Markets and the Changing Framework of US-Japan Economic Relations,”** in M. Nakamura (ed.), *Japan's Business and Economic System*. Basingstoke, Hampshire: Palgrave, 2002, pp. 227-44.

The background for this paper is that postwar U.S.–Japan economic relations had to deal with the rapid growth of Japanese exports to the United States in response to U.S. GDP growth, taking into account the continuing evolution of the composition of Japanese exports as its industrial structure was changing. Saxonhouse assesses the impact of the U.S. Super 301 legislation in 1988, the Uruguay Round negotiations (and the dispute settlement mechanism), and the 1995 U.S.–Japan automobile agreement by looking at equity market data to analyze the consequences of these trade policy changes. He carries out event studies of Japanese and American companies presumably affected by these policy changes. He lays out his equation framework and provides estimates of the effects on company stock prices. Japanese equity prices were significant for Super 301 and the Uruguay Round in the expected direction, but not for U.S. company equity prices. Neither was significant for the auto agreement. Nonetheless, the auto agreement was considered in the United States to be politically beneficial to the Clinton Administration.

**“Prospective Japanese Economic Recovery: Perspectives from European Economic Recovery in the 1930s,”** in R.M. Stern (ed.), *Japan's Economic Recovery: Commercial Policy, Monetary Policy, and Corporate Governance*. Cheltenham: Edward Elgar, 2003, pp. 265-82.

After introducing a zero-interest rate policy and declining to set a numerical definition of price stability, the Bank of Japan reversed both policies in March 2001 and adopted an inflation-rate target to guide monetary policy in a setting of persistent deflation. Sweden went through a similar experience in the early 1930s when it adopted a quantitative price standard. It appears, however, that Sweden did not pursue a domestic price target. Rather, the Swedish Riksbank pegged the Swedish currency to the English pound, and this served to undo deflationary expectations in the United Kingdom, Sweden, and elsewhere. Sweden was fortunate in that the devaluation of the pound had a short-run expansionary effect on the global economy. Based on this experience, yen depreciation might conceivably change price expectations and promote



economic growth. However, in current circumstances, this policy might not be effective since it could set off a round of competitive devaluations by other major countries.

#### **D. Technology and Innovation**

- Chapter 2            Industrial Restructuring in Japan**
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