

Recent Industrial Policies in Japan

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1 Introduction

Industrial development policies in Japan since the 1970s led to a transformation of the economy towards a more capital- and knowledge-based one. This came at a time when the long-run growth rate (5-year moving averages) of the Japanese economy slowed down from about 9% in the 1960s to about 4% in the 1980s to less than 2% in the 1990s and virtually to 0% in the 2000s (see Fig. 1). During the same time, the share of relatively more capital-intensive industries, such as iron and steel, smelting, and refined petroleum products, decreased remarkably after the 1970s and that of technology-intensive industries and related services, such as transport equipment (automobiles, in particular), telecommunication services, research and development (R&D), information technologies (IT) and IT-related services, and medical services, increased during the same period. Table 1 portrays this transformation since 1970. The share of primary industries such as food and textile in total output also dropped significantly since the 1970s. The output share of medical services (public, private, and nonprofit combined), which is deemed as a promising sector nowadays, in particular demonstrated a rapid increase, from around 2% of total output in the economy in the early 1970s to more than 4% in 2009. IT services, another promising industry, on the other hand increased its share in total output sixfold from only 0.2% to about 1.8% during the same period. All these trends point to increasing importance of knowledge and technology and, accordingly, a significant structural change in this direction in the Japanese economy.

The transformation in the structure of the Japanese economy was facilitated by industrial policies of the economic bureaucracy, Ministry of International Trade and Industry (MITI), in particular. Industrial policies in Japan have evolved from traditional industrial policies that aimed at heavy industrialization during the 1950s and 1960s towards those emphasizing the development of the hi-tech and knowledge-

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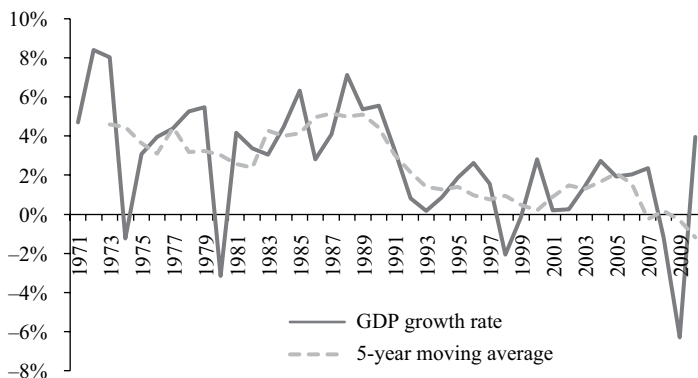


Fig. 1 GDP growth rates in Japan (1971–2010). *GDP* gross domestic product. (Source of data: Statistics Bureau of Japan)

intensive industries since the late 1970s. Following the nomenclature in Dobrinsky (2009), we will call the former “traditional industrial policies” and the latter “knowledge-based industrial policies.” The characteristics of industrial policies have also changed during this transformation. In this chapter, the evolution and the transformation of the industrial policies are examined and the current state of industrial policies in Japan is briefly described. For this purpose, we employ theoretical discussions about traditional industrial policies in Japan and knowledge-based industrial policies thereafter. The theoretical underpinnings of these two types of industrial policies are quite different from each other. The knowledge-based industrial policies rely more on the government mostly as a facilitator of coordination across private firms and in facilitating the dissemination of knowledge. Traditional industrial policies, on the other hand, relied on the government as a guide for industrialization, which provides blueprints and allocates productive resources in the economy accordingly.

In what follows, we first build on the concept of industrial policy and distinguish between these two different types of industrial policies in Japan. We compare two policies in terms of the role of the government and policy instruments. A major difference with regard to policy instruments is the importance given to innovation by private firms in collaboration with the public sector in the knowledge-based industrial policies while traditional industrial policies mostly emphasized technological catch-up and the strong presence of the government in deliberately guiding technology development.

Another important aspect of the recent industrial policies is the emphasis on the changes in global economic conditions and the changing nature of manufacturing in the modern economy. The economic bureaucracy admits that Japan lagged behind China and Korea in meeting the demands of the changing consumer needs in the modern economy. To cope with it, the government has recently put into action an ambitious strategy to help Japanese industries and firms restructure themselves and adapt to the changing ways of business-doing. These new policies implemented by the Ministry of Economy, Trade, and Industry (METI), which replaced MITI in 2001, carry some elements of traditional industrial policies as well.

Table 1 Output composition of Japanese economy (1970–2009), period averages (unit: %). (Source: RIETI, JIP 2012 Database)

Industry	1970– 1975	1975– 1980	1980– 1985	1985– 1990	1990– 1995	1995– 2000	2000– 2005	2005– 2009
Agriculture, forestry, and fisheries	3.5	3.1	2.6	2.3	1.8	1.6	1.4	1.3
Mining	0.5	0.5	0.4	0.3	0.2	0.2	0.1	0.1
Food, beverages, and tobacco	5.6	5.4	5.4	5.1	4.3	4.1	3.9	3.6
Textile and leather	2.6	2.4	2.1	1.9	1.6	1.1	0.7	0.5
Wood and furniture	1.7	1.6	1.3	1.1	1.0	0.8	0.6	0.5
Paper and printing	2.1	1.9	1.9	2.0	1.9	1.8	1.6	1.4
Rubber and plastic products	1.2	1.2	1.4	1.5	1.5	1.4	1.4	1.4
Chemicals and pharmaceuticals	2.6	2.5	2.7	2.9	2.9	2.8	2.7	2.6
Petroleum and coal products	3.9	3.4	2.3	1.7	1.6	1.6	1.3	1.2
Glass, cement, pottery, nonmetallic minerals	1.6	1.4	1.3	1.2	1.1	1.0	0.8	0.7
Iron and steel	4.2	3.8	3.3	2.7	2.3	1.9	1.7	1.8
Smelting and fabricated metal products	2.6	2.4	2.4	2.4	2.4	2.2	1.9	1.7
Industrial machinery	3.1	3.0	3.5	3.7	3.6	3.3	3.0	3.4
Household electric appliances	0.2	0.4	0.6	0.7	0.8	0.8	0.9	1.2
Electronic and communication equipment	0.7	0.8	1.4	2.2	2.7	3.7	4.5	5.8
Transportation equipment	3.0	3.5	4.1	4.5	4.7	4.4	5.0	5.7
Precision equipment	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4
Miscellaneous manufacturing	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.4
Construction	13.0	12.1	10.6	10.2	10.5	9.1	7.6	6.6
Electricity, gas, and water supply	2.3	2.4	2.3	2.3	2.4	2.6	2.6	2.6
Wholesale and retail trade	7.3	8.1	8.9	9.0	10.2	10.9	10.2	9.5
Finance and insurance	2.4	2.8	3.1	4.3	4.5	4.6	4.8	4.6
Real estate and housing	6.2	6.7	6.9	6.6	6.5	6.8	7.0	6.9
Transportation services	5.3	4.9	4.6	4.4	4.5	4.2	4.0	3.9
Telecommunication services	0.6	0.7	0.7	0.8	0.9	1.5	2.2	2.1
Research (private)	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Research (public)	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Research (nonprofit)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Medical (private)	1.4	1.8	2.2	2.0	1.9	2.1	2.5	2.7
Medical (public)	0.3	0.4	0.5	0.5	0.6	0.6	0.6	0.6
Medical (nonprofit)	0.3	0.4	0.6	0.7	0.7	0.8	0.8	0.8
Information services and internet-based services	0.2	0.3	0.5	0.7	0.8	1.1	1.7	1.8
Other public and private services	20.3	21.0	21.4	21.2	21.0	21.7	23.2	23.9

The shares are based on real value of output in 2,000 prices

The rest of the chapter is organized as follows. Section 9.2 briefly describes the theoretical underpinnings of industrial policies with a comparison of traditional and knowledge-based industrial policies. The third section summarizes the evolution of industrial policies in Japan. The fourth section describes the current state of Japanese industrial policies. Finally, Sect. 9.5 concludes with a wrap-up.

2 Traditional and Knowledge-Based Industrial Policies: Theoretical and Empirical Underpinnings

2.1 Debate on the Concept of Industrial Policy

The debate among economists on the concept of “industrial policy” is multifaceted and it has both ideological and theoretical dimensions. Nowadays, the term “industrial policy” has a general meaning and economists generally refer to any kind of government aid to help private sector and various forms of financial and technical assistance for private businesses to flourish.

In this chapter, we define traditional industrial policy as “a set of policies designed for the development of selected industries to increase the welfare of the country and to achieve dynamic comparative advantages for these industries by use of state apparatus for resource allocation,” as defined in Akkemik (2009, p. 10). We take the view in Chang (2011) that private businesses do account for the success of industrial policies, but as opposed to the short-term focus of private businesses, the state (bureaucrats) implementing industrial policies has a rather nation-wide and long-term view of industrialization.

There are two strands of research on industrial policies. One strand of research focuses on theoretical aspects. The other strand examines the implementations of industrial policies across a wide range of countries. In a recent review of industrial policies, Rodrik (2008) argues that the theoretical case for industrial policy is much stronger than the empirical one. The theoretical underpinnings of industrial policy emphasize market failures and the corrective role the government can play. This is the rationale behind the traditional industrial policy. Rodrik (2008) also points out that due to the difficulty in implementation, industrial policy is practically ambiguous for skeptics. He raises various examples from across a wide range of countries where governments failed in their attempts to stimulate structural changes in the economy by intervening in the working of the markets. He argues that industrial policies may invite corruption and rent-seeking if implemented unsuccessfully.

Among the early theoretical and empirical debates on industrial policy, those such as Johnson (1982), Amsden (1989), Wade (1990), and Chang (1993) focused on the successful government-led industrial development experiences of East Asian economies, namely, Japan, Korea, and Taiwan (Akkemik 2009). These studies generally admit successful selection of industries during the course of industrial development and that these governments played an important role in enhancing comparative advantages of the respective economies by stimulating structural changes and the allocation of resources towards strategic industries through subsidies and other forms of support. Infant industry protection during the early stages of industrial development was another important pillar of industrial policies. Infant industries generally contain dynamic scale economies and they are generally selected due to their high income elasticity. Due to market failures in the allocation of productive resources, including financial resources, a Big-Push kind of industrial development plan is generally deemed necessary because the infant industries also have strong interlinkages. Therefore, coordination during the nurturing and development of

these industries is an important issue. Nurturing of these industries at the infant stage requires protection from foreign competition. Needless to say, they also enjoy various forms of government support that help them improve their productivity and competitiveness. Scale economies help these industries achieve competitive edge after successful exploitation of the domestic market (see Itoh et al. 1991). Successful industrial policies generally encourage these industries to expand their production to overseas markets via exports to reap further benefits from scale economies. At this stage, these firms are generally ready to compete with their foreign counterparts. The successful examples in East Asia were used to justify the positive role of the government in overcoming market failures. However, it should be noted that there was not a standard formulation for industrial policies in these success stories. Rather, as shown by Akkemik (2009), different historical and cultural conditions across countries led to different sets of policies.

On the other end, there are economists who are skeptical about the positive role of the government in industrial development. For these economists, what the governments did to contribute to industrialization was to make the markets work efficiently mainly by providing the necessary infrastructure and legal and regulatory measures. These economists explicitly downgrade the industrial policies of the government and stress the importance of the private sector. They assert that leading the markets by industrial policies requires that economic bureaucrats obtain a considerably large amount of information about the markets and the private firms, which they deem virtually impossible to acquire and process. Therefore, they claim that the government cannot effectively realize resource allocation and should leave it to the market to allocate resources to their best uses. It is obvious that these economists focus their attention to large costs involved with industrial policies. However, World Bank (1993), sharing the opinion that the industrial policies in East Asia were market-friendly by their nature, also praised the governments for getting the policies right so that the benefits were much larger than the costs, thereby yielding positive gains for the economy.

From an institutional economics perspective, Aoki et al. (1998) provided evidence for the importance of complementary relations between the government and private businesses in East Asia's economic development. In this framework, which they name "market enhancing approach," the government plays an important role in establishing and maintaining coordination between private sector firms and between public and private agents in the economy.

2.2 Traditional Industrial Policy and Its Instruments

The instruments of traditional industrial policy are explained in detail in Akkemik (2009, pp. 13–24). In this subsection, we suffice with a short summary with some additions.

Competition Policy: It is well known that, from the 1950s to the 1970s, the Japanese economic bureaucracy encouraged cooperation rather than competition. This was an ideological issue at the bureaucratic level. Johnson (1982, pp. 221–224) showed that, starting from 1952, MITI organized domestic industries by setting

production constraints or quotas for each industry and reorganizing them by determining the market shares for major producers in each industry. Bureaucrats threatened those firms who resisted such bureaucratic practices to cut their materials and funds. By doing so, the government effectively created oligopolistic markets, so to say “legal cartels,” under the control of economic bureaucrats and strictly controlled market entry and exit (Katz 1998; Okazaki and Okuno-Fujiwara 1999). Rationing of foreign exchange and funds was used by these bureaucrats as carrot or stick. The dominant type of organization in these industries was the *keiretsu*. After the liberalization of international trade and later capital movements starting from the mid-1960s, the government shifted its focus away from infant industry protection to enhancing international competitiveness of domestic industries. For this purpose, the government encouraged mergers and hence increased economic concentration (Kuchiki 2003). Creation of economic rents by bureaucrats for the large firms in oligopolistic markets was carried out successfully and did not suffer from the potential risk of perpetuation of rent-seeking by these favored large firms (Itoh et al. 1991, pp. 177–178).

Trade Policy: Japanese industrial policies aimed to create dynamic comparative advantages for the Japanese firms. Infant industry protection was lifted when these firms became competitive and trade liberalization was introduced after the mid-1960s. However, Osada (1993) showed that even after trade liberalization effective protection rates for strategic industries such as automobiles and electrical appliances were still very high.

Tax and Financial Sector Policies: Japanese economic bureaucrats extended tax incentives, such as accelerated depreciation and exemption from import taxes for capital goods imports, and low-cost capital to firms for use in industrial investments and industrial rationalization (i.e., technological upgrading) in targeted industries. Ministry of Finance, MITI, Bank of Japan, Japan Development Bank, and Exim Bank of Japan, among others, directed public and private funds towards targeted industries. It is also well-known that the private funds accumulated in the postal savings system were partially used for such investments through the Fiscal Investment and Loan Program, which served as a second budget for the Japanese government for industrial investments and rationalization of the production techniques.¹ The main bank system was also used effectively to finance capacity expansion and rationalization in industries (Teranishi 1999).

Labor Market Policies: After fierce disputes between capitalists and labor, Japanese bureaucrats created positive industrial relations conducive to economic development around the early 1960s. The government also encouraged large industrial firms' attempts to create a business culture in line with such industrial relations as reflected in the life-time employment system, seniority-based wage system, and

¹ It is true that most of the publicly controlled funds, especially postal savings in the Fiscal Investment and Loan Program, were used for infrastructure and welfare-state purposes. However, this shall not degrade the substantial amount of funds reserved for industrialization notwithstanding the private funds that were mobilized indirectly by government guidance for the same purpose.

enterprise-based labor unions. In addition, productivity improvement through quality enhancing practices such as quality circles and total quality management were promoted by Japanese companies.

Technology Policies: During the catch-up stage, Japanese companies were heavily dependent on foreign technologies. When the technological gap with the advanced West was largely closed by the early 1970s, Japanese companies started restructuring themselves to enhance their competitiveness and to improve their ability to generate new technologies in the promising high-tech sectors with high value-added content such as electronics, computers, and automobiles. The government played an important role as a facilitator of knowledge creating and dissemination. To this aim, the government promoted coordination between public and private R&D firms and private companies. Joint R&D research projects were subsidized and various cheap financing schemes were provided. These are also essential components of the knowledge-based industrial policies which are discussed in detail in the following subsection.

Foreign Investment Policies: It is well known that ideologically the economic bureaucrats at MITI were against utilization of foreign investment in industrialization (Johnson 1982, pp. 80–81). These bureaucrats were nationalist in general but not xenophobic. They valued national interests more and preferred domestic entrepreneurs with whom they had already established a symbiotic relationship. To discourage acquisition of Japanese firms by foreign firms, they promoted the main bank system and the cross-shareholding system within the *keiretsu* system. Changing global business environment led to changes in industrial policies. According to Chang (2011), these changes are related to the increasing internalization of industrial production and the changing way of “doing business” with regard to global supply chains.

2.3 Knowledge-Based Industrial Policy and Its Instruments

Pack and Saggi (2006) point out that international competition has taken a different shape nowadays in the era of knowledge economy with extremely rapid innovation and rapidly falling prices and fast-changing product characteristics. These severely limit governments’ capabilities to steer the market unlike the 1950s and the 1960s. However, this does not mean that the market mechanism is the only or the best option. There are strong reasons, both theoretically and from policy implementation viewpoint, to expect that the governments in the era of knowledge economy can still play a role but with a different motivation.

The role of the government took a different shape in the knowledge economy where the diffusion of knowledge and industrial information is crucially important. In this case, the government and its interventions in the market can play a positive role in industrialization by facilitating the generation and spread of knowledge to all stakeholders. The current stage of industrial development based on knowledge is

very different from the heavy industrialization stage of industrial development and necessitates a differentiated role for the government in industrial development. In the knowledge economy, public sector is thought to be more of a facilitator of the creation and spread of knowledge by and among private firms rather than an agency governing the market and guiding private firms in which activities they should invest as in traditional industrial policies. This is because of the different nature of knowledge. Effective spread of knowledge across economic activities and firms is crucially important in the knowledge economy. Rodrik (2008) points to the multi-dimensional character of the information flowing from the firms to the government and stresses that there is a need to create a mechanism to elicit information about the constraints in the market which will also facilitate collaboration between private businesses and the government. Rodrik emphasizes that the right industrial policy is one that creates and maintains strategic collaboration and coordination between the private and public sectors in order to design the most appropriate forms of government interventions. He raises the case of deliberation councils as a successful example that works. Rodrik (2008) proposes a form of knowledge-based industrial policy without naming it so. In Rodrik's prescription, bringing discipline to the market is favorable when it is a workable option because that might enhance the flow of information from the market to the government.

The role of the government as a coordinator in industrial development, as proposed by Rodrik above, in fact, has been discussed earlier in the industrial policy literature, e.g., by Okuno-Fujiwara (1988). He showed that government can enhance coordination among firms by communicating and facilitating the exchange of various sorts of information with regard to production plans and intended allocation of productive resources. He further argued that markets often fail in establishing and maintaining such information exchanges. MITI-guided deliberation councils in Japan, among other institutions, often served this purpose. Pack and Saggi (2006) also argued that modern industrial policies should address collaboration and information sharing among private firms to enhance comparative advantages. They also demonstrated that there was little transmission of knowledge from targeted to nontargeted industries even though the industrial policies succeeded in stimulating structural changes.

Dobrinsky (2009) compares the traditional and knowledge-based industrial policies with regard to objectives, rationale, and policy instruments. He takes the term "industrial policy" in its general meaning, which is not directly comparable to our view of industrial policy. However, he provides a comprehensive overview and outlay of traditional and knowledge-based industrial policies. His comparison of traditional and knowledge-based industrial policies encompasses a large number of countries. Table 2 compares the two types of industrial policies. Here we take his taxonomy of various policy instruments and base our arguments for Japan's knowledge-based industrial policies on this taxonomy. This subsection draws heavily on Dobrinsky (2009).

Dobrinsky (2009, p. 274) defines "knowledge-based industrial policy" as follows: "a new brand of public sector interventions targeting various structural aspects of the economy through transmission channels and mechanisms that hinge on the driving forces of knowledge flows and stocks and incorporating a systemic understanding of the policy rationale." This brand of industrial policy has become

Table 2 Comparison of traditional and knowledge-based industrial policies. (Source: Obtained and modified slightly from Dobrinsky 2009, pp. 278–279)

Criterion	Traditional industrial policy	Knowledge-based industrial policy
The role of the state	The state is endowed with rationality	The state has bounded rationality
	The roles of the state and the private sector are separated	The roles are not separate and public–private partnerships are encouraged
	The state acts as a referee, not a player	The state is a player and a stakeholder in the knowledge creation process
Rationale for policy intervention	Enhancing social welfare	Fostering dynamic competitiveness
	Promoting industrialization and economic development	Helping stakeholders achieve mutually agreed goals
	Exploiting economies of scale	Economies of scope
	Address market distortions	Facilitate smooth operation of markets
	Mitigating the negative implications of externalities	Discovering externalities and relevant remedies
	Enhancing performance of economic agents	Facilitating risk sharing among agents and stakeholders
	Establishing rules of the game for others to play	Helping and coordinating market agents in establishing acceptable rules of the game
Targets of intervention	Output and factor inputs	Systemic interactions
	Firms and industries	Networks and systemic linkages
	Winners (selected industries)	Specific behavioral aspects across firms
	Supply side of the economy (producers)	Both supply and demand sides (producer–user cooperation)
Expected effects of intervention	Responses traceable to agents	Systemic responses
	Distinctive response	Range of possible responses
	Measurable (quantitative) responses to intervention	Some responses qualitative in nature
Design and implementation of policy intervention	Policy objectives are exogenous in nature	Policy is a learning process and policy objectives are endogenous
	Sequential phases of policy design and implementation	No clear distinction between policy design and implementation
	State monitors implementation	State participates in implementation

important in the “knowledge economy” into which post-industrial economies transform. Dobrinsky shows that economic theory follows this change as well and especially institutional and evolutionary economics provide a theoretical foundation for knowledge-based industrial policies. Without getting into detail on this aspect, in what follows, we elaborate on some empirical issues for knowledge-based industrial policies.² Traditional industrial policies treated knowledge as a homogeneous

² The reader is guided to Dobrinsky (2009) for a thorough debate surrounding a large number of concepts, such as codified and tacit knowledge, appropriability, knowledge spillovers, innovation, national innovation system, horizontal and vertical policies, knowledge externalities, innovation intermediaries, seed-and-breed support institutions, cluster policies, and so on, as paradigmatic foundations of the knowledge-based industrial policies. Dobrinsky explains the paradigmatic shift in large detail. Early on, knowledge was treated as a homogeneous public good with the characteristics of nonrivalry, nonexcludability, and nonappropriability. Endogenous growth theory distinguished rivalrous and nonrivalrous components of knowledge and knowledge is not treated

public good with externalities and knowledge spillovers as sources of market failures and hence it was argued that government intervention prevented under-supply. However, knowledge-based industrial policies relying on evolutionary economics emphasize the heterogeneous nature of knowledge and various forms of appropriation by private firms. In addition, Dobrinsky (2009, p. 281) argues that evolutionary economics does not treat knowledge as public good, especially tacit knowledge, and treats some types of knowledge as proprietary and argues that knowledge-spillovers apply to only specific types of knowledge. This, according to Dobrinsky, lessens the need for government intervention.

The role of the state: In traditional industrial policy, the state had a regulatory role in the economy while in the knowledge-based economy the state is rather a coordinator of knowledge dissemination and sharing. The competition policy of the state in traditional industrial policy emphasized market distortions and the correction of market failures. If the government adopts the traditional industrial policies in the era of knowledge economy, it will face a number of serious problems as discussed by Pack and Saggi (2006), such as the designation of firms and industries that would generate knowledge and knowledge spillovers, designation of firms and industries that would benefit from dynamic economies of scale, and estimation of the sizes of industrial spillovers and scale economies. However, in line with the Schumpeterian approach, knowledge-based industrial policies emphasize the heterogeneity of firms and hence differentiated policies for individual firms rather than a single competition policy applied to all firms as in the traditional industrial policy. This is because knowledge-based activities of firms determine the pattern of competition and monopolistic power of a firm is expected to increase with more investment in knowledge. The state in knowledge-based industrial policy facilitates knowledge and skills formation and promotes public–private partnership for this purpose.

Policy rationale: Traditional industrial policies relied on welfare economics and market failure. In the knowledge-based industrial policy, there are more interventions but these interventions are less ambitious. As Dobrinsky (2009, p. 284) puts it: “Knowledge-oriented policy is much more about greasing the system than about direct intervention.” This means that government interventions in the knowledge-based industrial policy are not addressing specific industries but rather systemic and knowledge-specific failures of the market in coordination.³ An important aspect of government intervention of this type is that it gives the government a big role in facilitating the market mechanism. Ironic as it may seem, the existence of knowledge externalities calls for government intervention to promote knowledge creation and knowledge-sharing process and thereby enhance entrepreneurship. The state is assumed to possess the capacity to undertake this task.

as a homogeneous good any more. Evolutionary economics, for instance, made a distinction between codified knowledge (such as published scientific knowledge) and tacit knowledge (such as skills and know-how).

³ Pack and Saggi (2006) argue that the government can play a role in enforcing property rights over knowledge and government intervention for this purpose can be tolerated.

Traditional industrial policies picked the “winners” while knowledge-based industrial policy is more “horizontal” by nature. Rather than designing industry- or firm-specific (“vertical”) policies, knowledge-based industrial policy focuses on creating an environment whereby the interactions and network relations are enhanced to resolve the market failures.⁴

Policy instruments: Dobrinsky (2009, pp. 288–298) provides a typology of policy instruments. Below we summarize the main instruments:

- *Instruments supporting and facilitating the generation and accumulation of knowledge:* There have been changes in the allocation of public funds to support R&D activities. First, funding of R&D has become more selective. Second, project financing emphasizes collaboration among private firms rather than targeting a specific firm or industry. Third, financing schemes are based more on competition basis, i.e., unsuccessful firms are allowed to fail and only surviving firms, which also bear and share among themselves the risks, receive the bulk of the financial resources.
- *Instruments addressing uncertainties and knowledge externalities and supporting and facilitating the transmission and dissemination of knowledge:* These instruments, financial and nonfinancial, aim to internalize the externalities related to knowledge and knowledge spillovers at different stages of knowledge generation and dissemination process. A well-known case is the provision of patent rights for innovative firms. Apart from this, majority of the financial instruments under this category are allocated to start-up firms rather than established ones. Strengthening of industry–university or industry–science relations are generally an essential component of such financing schemes. The state generally plays a role as a facilitator and coordinator, not the driver (as in traditional industrial policy) of knowledge generation. In the selection of the firms to be funded for knowledge investments, the state does not adopt “picking the winners” type of a policy where the firms are selected in advance, but rather leaves it to the market forces to determine those firms. Therefore, these financing schemes are “pro-market” in nature. There are also nonfinancial support mechanisms involving risk sharing and internalization of externalities. These are related to the coordination capacity of the state. For instance, facilitation of the flow of knowledge (both codified and tacit) and promotion of the sharing of risk through systemic interventions in the form of coordination and information sharing serves for this purpose. To this end, there are “innovation intermediaries” that facilitate the dissemination of generated knowledge such as technology transfer offices at universities. In short, the government can intervene in the market to facilitate risk sharing and to establish collaborative relations among private entrepreneurs on different stages of the value chain.
- *Instruments promoting connectivity and coordination through knowledge sharing:* Dobrinsky calls these instruments “hybrid” because they incorporate

⁴ Dobrinsky (2009) also shows that in various countries the promotion of small and medium-sized enterprises (SMEs) in a specific sector can be called a hybrid system incorporating elements of traditional and knowledge-based industrial policy.

different instruments and perform different knowledge functions. Examples of these instruments are business incubators, science and technology parks, “seed-and-breed support institutions,” and public–private partnerships. These instruments facilitate connectivity and coordination. By doing so, they help resolve the problems of information asymmetries. Another type of instrument, cluster policies, helps create positive externalities among entrepreneurs.

On the effectiveness of these policies, Dobrinsky (2009, p. 298) argues that evaluation is rather difficult because (1) policy objectives are often vague; (2) many instruments are of systemic in nature, hence making the evaluation of individual entrepreneurs difficult; and (3) some of the policy outcomes are of secondary nature arising from indirect effects. Overall, Dobrinsky (2009, p. 301) states that “Compared to more traditional policies, the newly emerging policy approaches presume a less assertive role for the state but are grounded on a broader, systemic rationale for intervention. The key transmission mechanisms of knowledge-oriented industrial policy hinge on the driving forces of knowledge flows and stocks and on systemic connectivity among stakeholders. Accordingly, knowledge-oriented industrial policy is a policy of “soft” touch that seeks to identify common interests and objectives, promotes collaboration among the stakeholders involved and relies on market-friendly models of cooperative effort.”

3 Transformation of Traditional Industrial Policies into Knowledge-Based Industrial Policies in Japan

3.1 Traditional Industrial Policies in Japan

It is well-known by now that Japanese economic bureaucracy, most notably the MITI, which was transformed in to METI in 2001, and Ministry of Finance played important roles as architects of industrial policies in Japan from 1949 onwards. They first protected targeted infant industries from foreign competition. When they became competitive and when Japan introduced liberalization in capital flows and international trade, these industries were opened to foreign competition. The strategic industries in the aftermath of the postwar period and the 1950s were designated as coal, iron, and steel industries, which had strong forward linkages. In the 1960s, the targeted industries were capital-intensive petrochemicals, steel, industrial machinery, electrical appliances, and automobile industries. After the oil shocks in the 1970s, high-tech and relatively less energy-intensive electronics, computers, and semiconductors industries received preferential treatment from the government.

The role of MITI in industrial development in Japan has been a controversial subject of debate. While most economists admit the positive role played by MITI in industrial policy formulation and implementation, some others such as Sakoh (1984) and Pack and Saggi (2006) argue that private firms were the major actors in industrialization in Japan and what MITI succeeded was the provision of superior infrastruc-

ture and a positive business environment by putting in place the appropriate policies for the development of private firms. On the extreme, Sakoh (1984) even claims that there is no clear evidence of “administrative guidance” and that Japanese industries did not particularly receive preferential treatment from Japan Development Bank. He contends that Japanese government was like other governments and mostly supported politically strong groups such as farmers and ailing industries suffering from comparative disadvantages such as energy-intensive ones. He points to “government failure” in the form of inefficiencies and overcapacity in industries the government attempted to allocate resources.⁵ However, this assertion is overly simplistic and ignores the political economy and state–capital relations which had indirect effects on industries. Based on a vast literature of empirical studies, it can be safely asserted that private firms were indeed the main actors and deserve most of the credit for successful industrial development in Japan but the role of MITI as a facilitator and early on as a “guide” cannot be degraded. It should be remembered that although substantial amount of public funds were mobilized towards targeted industries, Japanese industrial policies relied on private firms, not public firms. Also, as Chang (2011) warned, the impact of industrial policies shall not be confined to the performances of targeted industries only. They also have indirect effects such as complementarities, linkages, and externalities, which are difficult to quantify.

During the 1960s and 1970s MITI utilized “deliberation councils” and industry-level associations or organizations to guide the industries in investment and production decisions. Sometimes, retired bureaucrats (*amakudari*) were employed as top-level executives in the firms monitored by MITI and this enabled continued information exchange between the bureaucrats and the private firms.

In the 1970s and 1980s, MITI designated high-tech industries, including electronics, computers, and automobile, as strategic industries. MITI promoted the restructuring in Japanese high-tech industries to develop them into world-class competitive industries by offering various supports. An important development in the 1990s was the Science and Technology Basic Law (1995). This law obligated the Japanese government to support basic scientific research and share the created knowledge with all stakeholders in the industry. Science and technology policies of the government mostly favored upper-end electronics in the 1990s. The most well-known of such industries are various digital telecommunications equipment, flat-screen panel display, and cellular phone industries.

3.2 Recent Demise of Japanese Industries

The recent changes in the industrial policies are generally attributed to growing concerns of the Japanese government for the demise of Japanese industries and the loss of world markets to the emerging Asian economies, namely, China and Korea.

⁵ A notorious case is MITI’s order to Honda Motor Company to give up their decision to enter the automobile market in the 1960s. Despite the government’s resistance, Honda entered the market and proved to be a competitive firm at the global scale in the future.

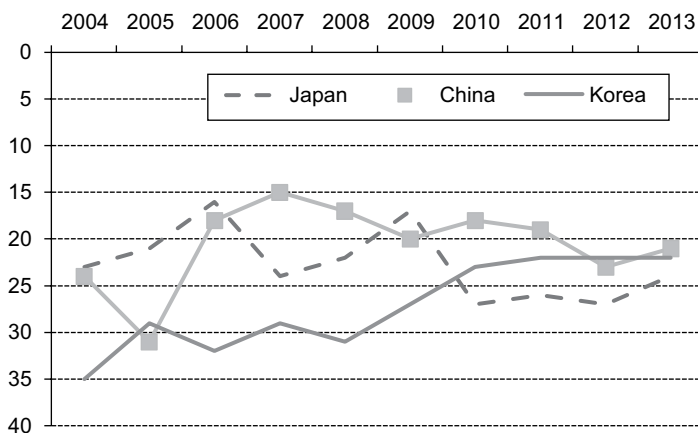


Fig. 2 World competitiveness rankings for Japan, Korea, and China (2004–2013). (Source: IMD, *World Competitiveness Yearbook*, various issues)

Economic bureaucracy, mainly METI, has responded to such changes by revising the industrial policies in line with the changing global economic conditions and changes in the manufacturing architecture.

It is easy to see from available data that Japanese firms seem to have lost the battle especially in the newly developing smart phone technologies and computer industries in the 2000s. Assuming the role of being the relevant agency to devise industrial development policies in Japan, METI is highly concerned about the declining rank of Japan as a major industrial power in the world economy. METI (2010) reported that the share of Japan in world gross domestic product (GDP) shrank remarkably from 14.3% in 1990 to 8.9% in 2008. The share of Japanese firms in world markets also demonstrated large declines during the last decade. To illustrate, Japan's share in lithium-ion batteries declined from more than 90% in 2000 to about 50% in 2008, the share of LCD panels from more than 80% (1997) to about 10% (2005), DVD players from 90% (1997) to about 20% (2006), car navigation systems from virtually 100% (2003) to about 20% (2007), and DRAM memory from about 40% (1997) to less than 10% (2004). In a similar fashion, METI emphasized that while Japan ranked first in the International Institute for Management Development (IMD) World Competitiveness Ranking, her overall rank declined to 22nd in 2008. It is noteworthy that Japan has recently been overtaken by her Asian neighbors Korea and China in the overall rankings of world competitiveness (see Fig. 2). In 2012, Japan's rank in the list was further below that level at 27th (IMD 2012). As of 2013, Japan (24th) still ranked below China (20th) and Korea (21st). However, these trends in competitiveness rankings do not necessarily mean total collapse of Japanese industries. Japanese firms have successfully maintained market share in some traditional products such as automobiles and digital cameras (METI 2010).⁶

⁶ It is noteworthy that the contribution of automotive industry, an industry Japan traditionally had a comparative advantage, to the economy declined from 2.5% of GDP in 2001 to only 1.1% in

3.3 *Restructuring in the Bureaucracy and Policy Formulation*

Transformation in industrial policies was accompanied by a large scale restructuring and change of mindset in economic bureaucracy. This is of central importance in understanding recent changes in industrial policies. New economic bureaucracy places more emphasis on the role of the private sector in industrial rationalization and restructuring and seems to be more aware of the importance of external relations as an engine of industrial growth.

During the central government reform in 2001, MITI was abolished and merged into the newly established METI. Prime Minister Junichiro Koizumi (2001–2006) carried out various reforms he called *Kozo Kaikaku* (structural reforms) to fully establish the market mechanism in the Japanese economy and its industries. Therefore, METI was given a duty quite different than MITI of the past. Officially, the government announced that the main task of METI is to strengthen the working of the free market principle in Japanese industries. Its role in industrial development seems to be mostly confined to assisting the private firms to enhance their productivity and competitiveness in the era of knowledge economy. METI does not interfere with investments and does not put any supply constraints as MITI did before. However, METI designates “priority” industries to be promoted. Officially, METI assumes a strong position in facilitating information exchange and coordination among private firms in the priority industries. Deliberation councils are still important policy instruments.

Shinji Fukukawa, former vice minister of MITI during 1987–1988, has written extensively in mass media about how the Japanese industries can be revived and what kind of policy changes are necessary for this purpose. Fukukawa (2010) reminds that the Japanese firms lost their global market shares to Korean firms in the flat-panel television market and they failed to exploit the profit opportunities in the global LED television, 3D television, and tablet computer markets. He emphasizes that in industries where Japan traditionally had a comparative advantage, such as steel and personal computers Japanese firms are losing their markets especially to the newly emerging Chinese firms. Fukukawa claims that the importance given to market mechanism and the demise of the traditional industrial policies can be held responsible for the decline of Japanese competitiveness in these industries, at least partially.

It is obvious that the Japanese government aimed to increase the knowledge content in industrial output, but largely failed in its attempts to stimulate “rationalization” in domestic industries, which might have resulted in increasing technological content matching those like iPad and iPhone (Fukukawa 2010). It is clear that Japanese firms followed, rather than led, these industries. The most striking fact is probably the rise of the “latecomers,” Korea, Taiwan, and China in these industries ahead of the once “forerunner” Japan. The governments in these three latecomers are well-known to be supporting high-tech industries in various forms, thus bring-

ing industrial policy back on the agenda. Japanese government, although it did not totally abandon its traditional industrial policies, relies more on private sector dynamism like the 1980s and the 1990s but the degree of support has been reduced significantly since then.

The London-based economics newspaper *The Economist* reported in 2010 that industrial policies, and hence government intervention, were back on the agenda for advanced countries' governments in the aftermath of the global financial crisis in 2007–2008 and during the Great Recession (*Economist* 2010). The newspaper asserted that the newly elected prime minister Naoto Kan wanted to create a new Japan, Inc. and that METI announced a strategy to combat the increasingly aggressive industrial policies of the top advanced economies. However, it was also stated that it is a very tough job for governments to correctly evaluate the costs and benefits of such interventions. The *Economist* also degrades Japanese industrial policies for the failure of the Japanese economic bureaucracy to develop a semiconductor industry during 1980–1982.

Fukukawa (2010) proposed four measures to be taken by the Japanese government to enhance competitiveness in high-tech industries:

1. Improving the business environment for domestic high-tech firms. For this purpose the following are deemed necessary:
 - Reducing the corporate tax rate (as high as 38 % since 2012, down from 40.69 previously)⁷
 - Undertaking the necessary regulatory reforms (for instance to allow domestic medical welfare service companies to extend their services to exploit the growing foreign demand)
 - Taking necessary measures to remedy the negative effects of environmental measures which led some Japanese firms to relocate their activities to more environmentally tolerant countries
2. The vision of the government should be clear and shared with the public.
3. Revision of corporate methods: In this regard, the old style management techniques in Japanese firms, which promoted vertical management relations, may need to be replaced with transverse management style, which promotes innovations.
4. Improvement in social infrastructure to promote innovation: Attracting foreign talent may be a viable policy.

These recommendations were reflected in METI's official growth strategy, which is discussed later in Section 4.2.

⁷ According to KPMG, corporate tax rates for the USA, China, Germany, France, Italy, Korea, Singapore, Taiwan, and the UK are 40%, 25%, 30%, 33%, 31%, 24%, 17%, 17%, and 23%, respectively (<http://www.kpmg.com/global/en/services/tax/tax-tools-and-resources/pages/corporate-tax-rates-table.aspx>, retrieved 4 June 2013).

3.4 *Did the Japanese Government Reduce Interventions?*

The answer to this question is not straightforward and requires a deep analysis of the changes in the political economy in Japan. Sato (2009) demonstrates evidence that the Japanese government did not reduce interventions. He takes the cases of Japanese and Korean steel industries and examines the evolution of the industrial policies in both countries. He argues against the common belief that industrial policies have served their purpose of heavy industrialization and the role of the government has since then (late 1970s for Japan and late 1990s for Korea) deteriorated and neoliberal policies replaced industrial policies. He shows that such a strong belief ignores the effort of the government in restructuring and rationalizing the ailing industries such as steel. He asserts that the restructuring of the national industries after the 1970s was not realized entirely by the private sector and the role of the state was never reduced during the process. For instance, the rationalization efforts after the second oil shock in 1979 were facilitated by the Japanese government partially by establishing a mechanism for communication of information regarding rationalization across private firms, reduction in corporate tax rates in order to create internal funds to be used for rationalization. In addition, the government facilitated coordination in the industry by cartels to control production and prevent overcapacity.

Allowance of holding companies after 1997 also helped government in this aspect. The investment boom during the bubble economy in the second half of the 1980s led to overcapacity and when then government decided to cut public expenditures after the bubble burst in the early 1990s, steel firms requested the government's favor for protection, which the government responded positively by helping these firms in restructuring and offered them tax incentives and preferential financial support. In other words, the relations between the government and industrial firms did not deteriorate over time and was revived in a different form during the Lost Decade of the 1990s when these firms were in financial distress.

According to Sato (2009), another important issue to take into account is the internationalization of Japanese companies. Overseas investments by Japanese industrial firms had already accelerated after the Plaza Accord (1985) due to real appreciation of the Japanese yen. Over time Japanese firms have established themselves as major providers of foreign direct investment in the USA as well as East Asia. Equally important, on the other hand, is the cooperation between Japanese and foreign firms. The government is actively encouraging such joint efforts especially in high-tech industries.

Sato (2009) points out that the Japanese government, most notably the economic bureaucracy, has played an important role as a mediator of interests between industrial firms, public sector, and recently, foreign firms. He lists some of the recent changes in government policies concerning the complex web of these relations as follows:

- Amendment of various laws, for instance allowing holding companies to be established.
- Promotion of mergers and acquisitions, including those involving foreign firms.

- Deregulation of the labor markets to allow flexible employment practices which would help firms economize on labor costs.
- Promoting rationalization and diversification of industrial activities.
- Reduction of corporate taxes.

4 Current State of Industrial Policies in Japan

A number of changes in the global economic conditions and the changing nature of manufacturing and business-doing led the Japanese economic bureaucracy and politicians to revise the industrial development strategy in Japan. This is obvious in the writings of ex-MITI bureaucrats such as Shinji Fukukawa (as shown below) and in the official reports of METI, such as the *Industrial Structure Vision*.⁸ This section explains the current state of industrial policies based on these sources.

Fukukawa (2012a) pointed out that competition will be fiercer in the manufacturing sector in the near future. As also argued by METI (2010), he asserts that partly responsible for this is the aggressive and offensive industrial policies of the USA and the EU aiming to “reindustrialize” as well as increasing supply capacity build-up in emerging economies, most notably in China and India. On the other hand, he warns that, not only Japanese manufacturing but East Asia in general, lags behind the USA in software while the region has specialized and gained a remarkable comparative advantage in hardware. This is especially important in the newly developed communication technologies. To remedy, he proposes that Asian economies take the necessary measures to enhance technology development capacity especially in information technologies, nanotechnology, biotechnology, medical care, environment, and the development of new energy resources. These are technology- and knowledge-intensive industries. Fukukawa (2012b) denotes that the government needs to take necessary steps to promote innovation in the private sector.

Japanese firms were praised for their productivity-enhancing management techniques such as total quality management, quality circles, and *kaizen*, in the 1970s and the 1980s, and even throughout the turbulent decade of the 1990s. To understand the comparative advantage of Japanese firms vis-à-vis other major industrial and industrializing economies, Fujimoto (2006) looked at specific products on an individual basis and proposed a new theoretical framework that focuses on the organizational capacity and manufacturing architecture is more useful. Fujimoto views comparative advantages across countries from the lens of manufacturing architecture and organization at the shop-floor level. He shows that large Japanese firms faced high growth and labor and materials shortages and therefore they established

⁸ For a long time, politicians have had secondary roles in the economic decision-making process. Economic bureaucrats were the principal decision makers with their strong influence in the respective markets they regulated. However, it seems that policy formulation surrounding various economic issues has recently been passed on to politicians. Economic bureaucrats seem to have receded from their historical strong position.

a system of long-term employment. Accordingly, they organized manufacturing activities in a way that encourages teamwork among multiskilled workers which Fujimoto names “integrative manufacturing.” This system, as exemplified by the *kanban* system, just in time system, and quality circles, among other shop floor-level practices, resulted in high productivity growth in Japanese industries.

Fujimoto (2006) distinguishes between two types of manufacturing architectures, namely, “modular architecture” and “integral architecture.” In modular architecture, the structural elements of a product are linked with only one function (i.e., standardized modality of interaction among components). Personal computer is a representative product for this type of manufacturing and various specific-purpose components imported from different countries can be assembled. In integral architecture, on the other hand, there are strong interlinkages among multiple structural parts of a sophisticated product and these parts simultaneously serve for multiple functions. Automobile is a representative product for this kind of manufacturing. Fujimoto argues that modular architecture yields quick results while integral architecture requires persistent improvement in product quality. He hypothesizes that Japan’s business culture is suited to integral architecture because its business organizations exhibit characteristics of integrative manufacturing and organizational capability. In other words, due to the organization of the shop floor in Japanese manufacturing firms, which encourages coordination, Japanese firms can be expected to have a competitive advantage in integral manufacturing products.⁹ Fujimoto (2006) also classifies various economies according to their comparative advantages based on manufacturing architecture. He contends that Japan has a comparative advantage in integral manufacturing while China and the USA hold comparative advantages in modular architecture for labor-intensive and knowledge-intensive products, respectively.¹⁰

The economic troubles of the two lost decades, 1990s and 2000s, seem to have affected the innovation consciousness of large Japanese firms negatively. Hence, they lagged behind Korean, Taiwanese, and Chinese high-tech firms, which is most notably visible in the smart television industry. It seems that the Chinese and Korean firms and the respective governments in these countries have found effective ways to introduce integral manufacturing architectures in their business cultures. Therefore, they appeared as strong competitors against Japanese firms. The govern-

⁹ Fujimoto (2006) also tests this hypothesis using survey data from Japanese firms. He found a positive correlation between the integral architecture characteristic of manufactured products and export to domestic production ratio. This result holds also when overseas manufacturing activities are taken into account. This finding can be taken as evidence for the comparative advantages of Japanese manufacturing firms in integral manufacturing products.

¹⁰ Fujimoto (2006) argues that integral manufacturing architecture requires the existence of highly capable supporting industries (typically, SMEs) and high level of human capital. Some Japanese SMEs (especially in Ota-ku in Tokyo and Higashi Osaka in Osaka) are well-known technology creators with strong base of innovation. The Japanese government is expected to play an important role in assisting private firms, especially the SMEs, in enhancing and continuously upgrading the technological capabilities of their production lines and workers. According to Fujimoto, the Japanese government had achieved limited success in such policies.

ment in Japan can also be held responsible for its failure to stimulate more innovation. In the case of R&D, for instance, the Japanese government has a number of R&D subsidies for private firms, but the official report of the Industrial Competitiveness Committee states that these subsidies are of a small-scale and short-sighted nature (ICC 2011).

All issues raised above demonstrate a departure of the Japanese industrial policies from traditional industrial policies of the past towards knowledge-based industrial policies. In what follows, certain features of the newly designed and currently implemented industrial policies are explained briefly.

4.1 *Strategic Industries*

According to the interim report of the Industrial Competitiveness Committee under the Industrial Structure Council, which was submitted to METI in June 2011, a major problem for the Japanese economy following the Great East Japan Earthquake in March 2011 was the hollowing-out (*kudoka*) of Japanese industries (ICC 2011). The report envisaged that developing the medical and healthcare, robot, transport equipment by integrating them with information technologies was crucially important to improve competitive power of the Japanese economy. This requires cooperation and coordination among various private businesses and the government as mediator. The report also deems globalization, i.e., trade and overseas investments, important for Japanese firms to expand their operations and sales overseas.

Recent industrial development strategy of the Japanese government emphasizes environment, energy, and medical industries including healthcare and biomedical sectors. These are highly R&D-intensive industries and persistent R&D investments are essential for growth in these industries. The government's stance in industrial development is such that it is trying to promote the participation of private sectors in these industries by providing various types of assistance and by facilitating and creating a suitable environment for private firms to interact positively with each other. An important component of the New Growth Strategy is *Industrial Structure Vision 2010*, prepared by the Industrial Competitiveness Committee in June 2010 (METI 2010). This strategy envisages the development of the following five promising clusters to ensure future economic growth for Japan (METI 2010):

1. Infrastructure industries such as railways, renewable energy, and ICT,
2. Environment-related creative industries such as next generation vehicles,
3. Content industry,¹¹
4. Medical and healthcare industries, and

¹¹ We do not elaborate on the content industry here but the government is highly ambitious about promoting this industry. Study Group on the Content Industry's Growth Strategy, which was established under METI, submitted its final report in May 2010. The report concluded that the content industry, i.e., design, fashion, traditional culture, and media products (such as anime and manga) with brand names, has a big potential to develop in the future as an engine of growth and to become a major export industry (SGCI 2010).

5. Advanced industries generating frontier technologies, such as robotics, nanotechnology, rare metals, and space.

The plan deems it important to continuously support these promising industries. To support these industries, the following measures were announced:

1. Attracting skilled human recession from abroad,
2. Establishing strategic centers,
3. Reducing corporate tax rate to enhance competitiveness vis-à-vis foreign firms,
4. A competition policies and legislation to monitor mergers to enhance competitiveness,
5. Trade policy that promotes integration with foreign markets, especially Asian markets, enhancing public R&D investments, and
6. Enhancing government–industry–university cooperation.

4.2 Industrial Structure Vision and Industrial Restructuring

Industrial Structure Vision admits the demise of the Japanese industries in the global markets and analyzes in detail the state of the Japanese manufacturing industries as of 2010 and proposes policies to improve competitiveness of the Japanese industries at the global scale (METI 2010). The report emphasizes the need for further structural changes in the manufacturing sector. In addition, the report also envisages that technological upgrading is important to enhance the competitiveness of Japanese firms and as such the business models of the Japanese firms need to be readjusted to meet this demand. The report also emphasizes the role of the government in facilitating the improvement in the competitiveness of Japanese firms. The plan envisaged to increase the size of these markets to 27 trillion yens (about US\$ 320 billion) by 2020 and create about 2.5 million more jobs (Economist 2010).

The recent change in the way of doing business in the manufacturing industries also seems to have changed the government's mindset. In modern manufacturing business, customer choices have gained priority over mass production with specified characteristics. This issue becomes especially important for exports, which required careful treatment of data related to consumers' preferences in overseas markets. In the *Industrial Structure Vision* METI contends that China and Korea could successfully adapt to the changes in production technologies and new ways of doing business while Japanese firms lagged in this regard. The report praises China and Korea for their success in materializing their comparative advantages in the supply of intermediate industrial products in the global supply chains. Therefore, compared to Japan, these two economies seem to have made better use of globalization of production. METI also warns against the danger of technology leakage. Another danger, according to the report, was deindustrialization as evident from decreasing number of manufacturing jobs and increasing number of overseas subsidiaries of Japanese companies, especially in the neighboring East Asian economies, a process also strengthened by the real appreciation of the yen at times.

Industrial Structure Vision envisages to change the business-doing traditions of Japanese industries in such a way that while the market shares of traditional industries where Japanese firms hold a competitive position (such as automobiles) are to be maintained for most industries promotion of the establishment of direct links with foreign markets is a desired corporate strategy (METI 2010). In addition, this long-term plan also acknowledges business opportunities provided by the need to deal with social issues related to environment (such as clean energy) and aging of the society (such as medical and healthcare industries and services).

4.3 Opportunities Provided by Overseas Markets

METI (2010) acknowledges the great potential for market expansion in the emerging and developing markets in the future. This is mostly due to growing middle class in these economies. According to World Bank (2013, p. 7), by the year 2030 the current population of 1.8 billion people in the middle class will increase to about 5 billion and Asia will account for a dominantly large portion of this increase. Therefore, penetrating into these markets is a vitally important issue for Japanese firms. METI, therefore, deems it extremely important to promote partnerships with these economies. On the other hand, these economies, most notably China, are an emerging rival for Japanese firms in the global markets as well. Japanese companies have traditionally been successful in penetrating foreign markets and recently their annual overseas investments (in net terms) has increased from under 40 billion dollars during 2002–2004 to more than 130 billion dollars in 2008 whereas their domestic capital expenditures declined by more than 37% in a single year in 2008 (METI 2010).

While admitting that exports are important for future growth, METI (2011) warned that Japan's competitive edge in overseas markets was diminishing due to the ambitious industrial policies of emerging markets, most notably Korea, Taiwan, and China. This is a major structural change in the world economy that the Japanese government views as an important constraining factor in devising industrial policies. Another major concern with regard to recent changes in the global economic environment was the problem of *endaka*, i.e., appreciation of the yen.

To cope with these changes, the government launched the New Growth Strategy in 2010. Three major pillars of this strategy as reported in METI's 2011 white paper were (1) maintaining the competitiveness of Japanese industries through active investment and employment policies, (2) increasing overseas investments by Japanese firms in order to enlarge the Japanese firms' shares in overseas markets, and (3) easing international business operations through policy actions such as stabilization of electricity supply, reducing corporate tax rate, providing support for investments in Japan, and economic partnership agreements.

An important reason for Japanese firms' declining competitive power in overseas markets, according to METI, is excessive competition and overlapping R&D investments which put Japanese firms in a disadvantageous position. METI sug-

gests that a certain corporate size through restructuring of the industries is necessary to reap the benefits of economies of scale.¹² METI (2010) compared Japanese and Korean firms and showed that Korean firms enjoyed a larger market size in the domestic economy than Japanese companies in the Japanese market, hence leading to lower profit rates for Japanese firms. For instance, in 2008, the market size per company for automobile firms was 1.02 million automobiles in Korea, whereas it was 0.7 million automobiles for automobile firms in Japan. Therefore, Korean firms enjoyed a market size per firm 1.5 times larger than that for Japanese firms. In steel industry, Korean firms' market size per firm was 1.5 times larger than Japanese firms, in cell phone industry it was 2.2 times larger, and in electricity generation industry it was 3.9 times larger. METI (2010) attributes the enhanced competitiveness of Korean firms to the ambitious industrial structure policies of the Korean government, which promoted mergers to boost scale economies. The white paper of METI (2011), therefore, demonstrates signs of further government intervention in industrial development, competition policy, and trade policy, in the near future.

5 Conclusion

The aim of industrial policies in Japan shifted from infant industry protection in markets governed by bureaucrats to the promotion of dynamism of the private sector for technology development under more competitive market conditions. With this shift in industrial policies, new policy instruments have been formulated. This chapter summarized these instruments within the context of recent knowledge-based industrial policies in Japan.

It is clear that Japanese firms are losing in the race of competitiveness in global markets, most notably in high-tech industries. As it was always expected throughout the recent economic history of Japan, the Japanese government needs to take necessary steps for this purpose. It is true that since the 1990s the Japanese government, more specifically the economic bureaucracy, left most of its autonomy in economic decision-making to private firms and government guidance was largely replaced with market dynamism. However, recent developments in the world economy after the global financial crisis in 2007–2008 and the subsequent rise of China as a threatening rival in global high-tech markets started a new debate in Japan about the role of the government. The concept of “industrial policy” is on the table again. However, this time, unlike the 1960s and 1970s, the government is expected to act as a facilitator of coordination and knowledge dissemination rather than governing the market.

The government undertook most of these reforms to help Japanese companies improve their competitiveness. Overall, Sato (2009) argues that the Japanese gov-

¹² Japanese government aims to facilitate this restructuring by providing financing through Innovation Network Corporation of Japan, supporting flexible labor market practices of private firms, and developing the legislation required for effective restructuring of industries, among others.

ernment can hardly be called “noninterventionist.” Accordingly, he contends that while the traditional industrial policies are rightly described by economists as government-intervention type of policies to correct market failures, it is misleading to argue that the recent industrial policies do not involve government intervention. He further argues that political economy is still very important to understand the changing nature of government interventions and industrial policies in Japan because what was eroded in Japan was only a specific type of state–capital–labor relations but not industrial policy. Such a heterodox approach, rare among academics, is necessary to understand the evolution of industrial policies in Japan. In a similar vein, Ikpe (2008) argued for Japan that developmental state does not require a zero sum game between the market and the state and that the interplay of various developmental activities surrounding structural transformation of industries and the development of capital markets impact the roles and outcomes. According to Ikpe, globalization does not necessarily run counter to the developmental state paradigm.

While adopting the new industrial policies, the government emphasizes the need to enhance competitiveness of Japanese industries by using various measures. METI (2010) emphasized declining competitiveness of Japanese industries due to high business costs such as high corporate tax rates, declining competitiveness of Japanese human resources, and declining power of port infrastructure. METI (2010) also warns that export-based manufacturing-oriented economies such as Japan and Germany faced declining employee compensation, which implies that there was severe cost competition from emerging economies. However, unlike Germany, Japan’s export dependence seems fairly low at only 17.4% of GDP in 2010, compared to 47.5% in Germany. This figure is even much lower than China (37%) and Korea (55%).

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