

Article

Success Factors of Asia-Pacific Fast-Developing Regions' Technological Innovation Development and Economic Growth

Elena Litsareva

Department of Oriental Studies, Tomsk State University, Tomsk 634050, Russia; elits2011@mail.ru; Tel.: +7-903-951-6407

Received: 27 July 2016; Accepted: 27 November 2016; Published: 1 March 2017

Abstract: Asia-Pacific's fast-developing countries and regions (FDCs)—South Korea, Taiwan Province of China, Singapore, Malaysia, and Thailand—demonstrate the most successful economic development models. The government represents the primary guarantee of FDCs' economic and social construction. Public and foreign investments and government policies to stimulate local and foreign businesses play a decisive role in the development of technological innovations in these FDCs. In these countries, basic research is increasing through the development of knowledge-based industries, the role of research institutes, the applied research undertaken, and the value of educational institutions. Close cooperation between science and industry led to a change in the structure and nature of the economy, which has become increasingly dependent on new knowledge and ideas.

Keywords: Fast-developing countries; Innovative environment; Knowledge-based economy; Human resources

1. Introduction

The Asia-Pacific Region (APR) is the only region worldwide in which economic regional ties are considered significant and that has not actually experienced military factor in national politics. Regional countries, which pay tribute to traditional relations, were turned into “postmodernist” states that invested significant economic potential into strengthening their welfare, science, and technological innovations, and developing regional integration organizations. The APR integration did not contradict the objective world development process of total globalization but also was the phenomenon that defended something that sets the region apart from globalization—the desire to collectively develop a common policy and a common political solution that are acceptable to all and that account for the national interests of the parties involved.

As is well known, the development of science and technological innovations has been a familiar issue in

the context of world economic growth during the twenty and twenty-first centuries and a significant debated issue in the context of socio-economic growth of the fast-developing countries and regions (FDCs) of South Korea, Taiwan Province of China, Singapore, Malaysia, and Thailand. In modern terms, the cost-effectiveness and ability to adequately ensure its citizens the necessary conditions for decent life, development, and prosperity are important identifiers of a country that is part of the global system. As a rule, the development of science and technological innovation forms the basis for gaining access to world markets and supporting the competitiveness of national and regional economics. FDC technological development is about significantly more than merely adapting or imitating existing technologies (American or Japan).

It is very important to evaluate the political and economic preconditions of FDC technological advancements in the twenty-first century and public policy in this field. The development of an innovative environment is an important element of public policy. Governments, businesses, universities, academia, and non-government organizations should be involved in working out and implementing economic policy and national strategy on an equal footing. Thus, in examining technological and FDC innovation development, we observe a complex interaction of elements.

Conceptual framework. The end of the 1970s and the beginning of the 1980s were connected with events of historical significance for the world economy. The economic crises of the 1970s and 1980s caused a slowdown in world economic growth and, in different ways, exacerbated social contradictions in developing countries in the APR. However, South Korea, Taiwan Province of China, and Singapore successfully emerged from the crises of the 1970s and 1980s and laid the foundation for modern industrial production, thus demonstrating the most successful economic development models. Against the backdrop of a depressed world economy and a slowdown in international trade at the beginning of the 1990s, growth rates were high (7%–11%) in South Korea, Taiwan Province of China, and Singapore. APR GDP growth rates were on average 7.7%, and the economies in Malaysia and Thailand grew at 6.6% (Litsareva, 2004, p. 136).

The APR has always attracted close attention from researchers. Some studies on the APR separated the region by economic and political integrity from other regions of the world. These studies also stated that the future belongs to Asia and that the center of world economic policy has moved to the East, particularly the APR. Therefore, special research is devoted to the rise of Asia (Acharya, 2008; Haas, 1989; Youn and Hyeng, 1997) and regional economic and financial cooperation (Amyx, 2004; Ando and Kimura, 2003; Giround, 2004; Henning, 2002; Thant, Tang and Kakazu, 1995; Lawrence, 1995; Lian, 2002).

It is widely accepted by researchers that economic development and success have been associated with the globalization and innovation processes, and the appropriateness of institutional structures. This acceptance requires an understanding of the economic development process within the context of increasing globalization of economic activity and the planning, implementation, and effectiveness of different policies (Beeson, 2007; Dunning, 2000; Dosch, 2006; Litsareva, 2007; Konstadakopulos, 2002; Chang and Ramkishan, 2001; Nesadurai, 2003). These elements are also intertwined with issues surrounding the role of South Korea, Taiwan Province of China, Singapore, Malaysia, and Thailand in policy-making and the specificity of national policies (Bowie and Unger, 2002; Yeoh and Lin, 2012; Huff, 1994; Meyer, 2001; Nah, 2005; Niels, 2007; Pang, 1982; Schein, 1997; Sum, 1996; Tongzon, 2002; Zainal-Abidin, 2000; Watkins, 2002).

Using a comprehensive literature review, the author of this article investigates FDCs such as South Korea, Taiwan Province of China, Singapore, Malaysia, and Thailand. This article discusses complex FDC development specificities, the influence on the APR's economic and financial integration processes, and in

particular, the triangulation of such success factors in creating a knowledge-based economy, government policies, and foreign investments. By analyzing factors such as creating a knowledge-based economy, the author pays special attention to policies related to human resource involvement and talent development. This topic was not sufficiently studied and described by the comprehensive literature.

These factors, selected by the author, contribute to FDCs' economic progress and to possible solutions to social and domestic issues, strengthening the authority of countries in the region and throughout the world and protecting their national interests. All of this has led to a significant change in the established system of international division of labor and has become a kind of challenge to the markets of developed European and American industrial states.

Research instruments: Methods. The author of this article used problem-chronological methods, participant observation methods, analyses of primary and secondary sources of information, and comparative analysis.

Materials. Expert opinions on the main issues of the article were collected on open resources, namely special websites, journal publications, and monographs.

2. History: The Main Specificities of FDC Development

2.1. *Favorable Geographical Position*

Some FDCs took advantage of their favorable geographical positions given that most of them are at the crossroads of the primary traditional trade routes. For example, Singapore, Rotterdam, and Shanghai have become the largest ports in the world, and Singapore's port has held first place in absolute value of ship tonnage since 1997. During the colonial era, Singapore was an important strategic point of the British Empire. Its economic value was determined primarily through trade and transport functions arising from its favorable geographical position as an island in a sea that links the Pacific and Indian Oceans.

2.2. *Highly Competitive Environment and Flexible Taxation Policy*

Given a highly competitive environment and flexible taxation policy, Singapore has become the largest banking center. For example, in Singapore, the Government of Lee Kuan Yew significantly reduced the tax burden on foreign businesses, completely relieving foreign companies and private investors from taxes during a five-year period. This policy caused transnational corporations to begin funding and developing research and development (R&D) for the introduction of new production facilities in the country and expanding their industrial exploitation (Property tax 2008). Given the increase in public and foreign investments, Singapore's financial sector, which contributed more than one-third of the country's GDP growth, became the second engine of the economy—equal to the industrial engine. Regarding the volume of transactions in foreign currency, Singapore's international monetary exchange was one of the world's leading financial centers, along with London, New York, and Tokyo (Niels, 2007).

2.3. *Japanese Capital*

The FDC economic boom occurred when Japanese capital, having felt its force, began looking for a new area of application. In the 1970s, Japan took the leading position among FDC foreign investors and actively invested capital in states' economies. Japan financed industrial projects, provided components for on-site

assembly, and trained local personnel. This effort helped acquire political and strategic support in these countries and ensured the supply of raw materials, energy, and food resources. It was very important for Japan to contribute to improving global supply and demand through joint efforts with other regional countries regarding the search for alternative sources of energy, the development of the supplier agricultural base, and collaboration in technology and finance (Litsareva, 2001, p. 34). Increasing Japanese investment capital in the APR has led to more dynamic development of FDCs and higher exports of industrial capital.

3. Influence of FDCs on the APR

3.1. *Growth Triangles*

South Korea, Taiwan Province of China, Singapore, Malaysia, and Thailand facilitated folding around themselves a range of trade linkages and interdependencies in the form of Local Economic Zones (LEZ). As a part of their export expansion strategy, transitioning from an import substitution strategy to an export-oriented model—or more judicious selective imports and taking into account comparative advantages—South Korea, Taiwan Province of China, Singapore, Malaysia, and Thailand considerably complicated the further development of the international division of labor. LEZ combined border areas of three or more neighboring states with various production factors and aimed to create a larger regional market on the basis of economic complementarity, the joint utilization of productive and technological capabilities, and natural, financial, and human resources. In this case, LEZ or growth triangles linking Singapore with Malaysia and Indonesia, or Malaysia with Thailand and Indonesia, or Taiwan Province of China with China and Hong Kong (Hong Kong Special Administrative Region (HKSAR) of China) existed. Such areas caused problems in domestic FDC markets, and in markets of the European and American continents' developed industrial states and their agro-commodity partners.

Some of the “growth triangles” were formed on the initiative of the state. For example, the Southern triangle consisted of Singapore, Johor (Malaysian state), and Riau (Province of Indonesia). However, others such as South of China, Hong Kong (HKSAR of China), and Taiwan (Province of China) were formed because of a high level of economic complementarities and interdependence. Therefore, companies in Taiwan and Hong Kong actively developed the South of China Mainland in an effort to solve the acute labor shortage through geographic proximity to China Mainland and the country's “open door” policy. In addition, the main destinations of Taiwan Region's direct investments (FDI) (overwhelmingly located in Asia) are China Mainland and Vietnam, with China Mainland clearly being the most important destination of such investments. This phenomenon is connected to the Economic Cooperation Framework Agreement between Taiwan and China Mainland signed in 2010.

Singapore also initiated the creation of the Southern triangle to solve the acute labor shortage through the assistance of the southern state of Malaysia and the Indonesian provinces. One concern was the unskilled labor force employed in manufacturing, shipbuilding, and engineering. The Government of Lee Kuan Yew was not limited by the geographical factor of a country's attractiveness to foreign investors. Labor resources and, in particular, the training of these resources formed the basis of the country's economic prosperity. The Government formulated a leadership strategy of training skilled labor resources in the third world (Watkins, 2002). The influx of skilled workers, professionals, and entrepreneurs with capital and production experience with the rights to stay for the long term in the country was observed through a reduction in labor-intensive

industries and services and the simultaneous development of high-tech areas. Special working status and the right to permanent residence were provided to highly skilled workers and wealthy Chinese from Malaysia, Indonesia, Hong Kong (HKSAR of China), and Taiwan Province of China (Pang, 1982, pp. 549, 553).

To develop skills in knowledge-intensive industries, a special strategy was adopted. The main task of this strategy was to learn about Singaporean workers through public professional institutions. At the same time, the dynamic development of joint ventures occurred with foreign investors.

3.2. *The Motors of the APR*

Gradually, South Korea, Taiwan Province of China, and Singapore (along with Japan) developed into the most powerful regional motors, from which Malaysia and Thailand have benefitted. They transitioned from an import-substitution to an export-oriented model and were able to export their products to South Korea, Taiwan Province of China, and Japan, significantly increasing their import of industrial capital from these countries. The Government of Lee Kuan Yew has increased product exports to regional and global marketplaces and has attracted multinational companies to Singapore.

For successful development, these countries have used Japanese capital and the experience “of the Japanese economic model”. Japan developed a detailed scientific, technical, and innovation policy that resulted in the intensification of production and the growth of macroeconomic indicators. Usually, the basics of industrial growth are created through structural changes because of the move from trade policy to a production policy and a reorientation of exports, thus stimulating foreign investments.

At the meeting of the Association of South-East Asian Nations (ASEAN) in October 1993, economic ministers and representatives of the Japanese Ministry of International Trade and Industry, Japan, submitted a draft plan for technical assistance to Malaysia and Thailand. The plan called for promulgating total quality management systems that Japan had successfully developed and found to be very effective; developing human resources; and contributing to the development of industries and the economy as a whole. This project was designed to facilitate the implementation and promotion of total quality management systems and countries’ activities to develop their industries and promote international trade (Onitsuka, 1999, p. 41; Litsareva, 2007, p. 389)

4. **The Triangle of Success: Creating a Knowledge-Based Economy, Government Policy, and Foreign Investments**

In the beginning, FDCs studied the world’s experiences and used the missions of government agencies in different parts of the world to learn the “best” methods to achieve a new quality of life. An analysis of the experiences of world development shows that FDCs should take into account the fact that innovative products created by new technologies play a crucial role in increasing productivity, including developing highly skilled labor. The rapid increase in scientific knowledge and technological innovation resulted in economic growth and social benefits. Today, Singapore has the wealthiest economy in the world on a per capita basis, and South Korea’s and Taiwan Province of China’s standards of living are equal to some countries in the European Union. Despite the Asian economic crisis (1997–1998), FDCs such as Malaysia and Thailand began to boast a substantial middle-income population with significant purchasing power.

Countries with advanced scientific and technological systems increased their investments in new

technologies—including high technology—at the end of the twentieth century and the beginning of the twenty-first century. Therefore, South Korea, Taiwan Province of China, Singapore, and Malaysia began to approach recognized world leaders in the field of high technology (Japan, United States, Germany, France, and the United Kingdom).

It is necessary to consider that research and innovation activities include the creation and sale of scientific and technical products from production to the industrial use stage, including manufacturing; approbations and sales of pilot lots; the creation of software and systems that address data collection, reprocessing, and transmission; distributed computing systems; rendering of services in the area of applications; and servicing such products and systems. Therefore, some high technology FDC firms have initiated strategic alliances with foreign firms to gain competitive advantages. FDC strategic alliances of any type and in different fields, foreign investments, and outsourcing production beyond the national boundary are major sources of the increase in global connectedness and embeddedness. Innovation, technology transfer, direct investments, joint R&D, and human resource development (managers, specialists, and professionals) were relatively important types of strategic FDC alliances because, as a rule, local technology and innovation systems are not closed systems but evolve through the formation of local and global networks (Dunning, 2000, p. 343). Therefore, breakthrough technological innovations are required through interregional or international cooperation in scientific and technological innovation and development, and in preparing human resources for active participation by both regional economic actors and market and non-market institutions and actors and institutions at the world level.

In creating a knowledge-based economy, government policies and foreign investments have played a special role in FDCs' strategic alliances and their economic and innovation breakthroughs.

4.1. Knowledge-Based Economy and Talent Development

Given the development of a knowledge-based economy and the role of research institutes, undertaken applied research and educational institutions, conducting basic research has increased. The close cooperation between science and industry had led to a change in the structure and nature of the economy, which has become increasingly dependent on new knowledge and ideas (Materials of the Institute of Government Accounts and Finance, 2004).

Therefore, FDCs attempted to develop talent within their countries and attract talented people from all over the world. Special government bodies and institutions were created for this purpose. FDCs' practices show that only the state is able to facilitate increasing the number of students and young talent by initially simplifying the visa regime, stimulating an educational system, and even promoting the employment of foreigners trained in local universities. Academic and student mobility have contributed to finding and attracting talented professionals with "new knowledge". Such an approach allowed for contributions to the development of the national economy given the inflow of skilled personnel.

It is well known that the leading universities in the United States, the United Kingdom, and Australia play an important role in the development of talent abroad. They occupy the main niches of world-class R&D and knowledge transfer and facilitate the establishment of new international educational and research centers at the highest level. Most FDCs, such as Singapore, South Korea, and Taiwan Province of China, also undertake a policy of actively attracting foreign talent.

In these FDCs, despite global trends, education and innovation have become key development areas

because of the scarcity of natural resources and the frequent natural disasters (typhoons). The populations of Singapore, South Korea, and Taiwan Province of China are forced to rely on themselves and pursue a well-thought-out policy of preserving sustainable economic development and growth, and the governments are initially staked on openness, resulting in prosperity and success. Most FDCs, led by Singapore, South Korea, and Taiwan Province of China, pay significant attention to talent preparation and participation in the economy. Improving human resource quality by achieving a high level of knowledge and innovative capacity building, promoting human resources with science degrees, attracting foreign specialists, and using international exchange programs represent special directions taken by government policies. In this regard, strategic planning regarding human resources occupies a special place.

4.1.1. Taiwan Province of China and South Korea

At the initial stage of attracting domestic and foreign human resources, given an ability to use both internal and external sources, FDCs paid special attention to the experience of returning talent (professionals and engineers) working in the United States (Silicon Valley) and Europe. Thus, professional Taiwanese communities that integrated into the technical communities in both the United States and Taiwan Province of China helped develop social and economic bridges between Silicon Valley and scientific and industrial parks in Taiwan. The development of such transnational communities through the exchange of information and professional contacts led to Taiwan's success in the field of technological and innovational processes. Formal and informal communication occurs between individual investors and entrepreneurs, and between small, medium-size, and large companies and offices on both sides of the Pacific Ocean. All of this activity has played an important role in transferring technology and innovative ideas, and in creating scientific-technological parks in Taiwan. Thus, in 1979 in Silicon Valley, a group of Taiwanese immigrants established a branch of the Chinese Institute of engineers to exchange technical information. The Taiwan authorities considered engineers studying in the United States as potential resources to improve the island's position in the world economy. At the same time, the Taiwan's regimes always regarded any foreign community as not only a source of current trends and technologies but also centers that could provide advice on key aspects of its policy. Reliance on a foreign Taiwanese specialist's competence has held a special place in authorities' policy. Industrial Technology Research Institute (ITRI), the scientific and industrial park "Xin Zhu", and the Science Branch of National Scientific Council have established their offices in Silicon Valley. In addition, a foreign Taiwanese engineer and computer expert database was established to facilitate contact between the two regions and to provide necessary information to enterprises that seek to start a technology business in Taiwan. The accelerated growth of Taiwan's economy and its active authorities' policy of hiring experienced professionals and experts trained abroad led many experts to return to the region during 1980–1990. At the same time, many Taiwanese firms had their own research laboratories and centers in California. With the establishment of the Monte Jade Science and Technology Association in 1989, business linkages between Silicon Valley and Park "Xin Zhu" were institutionalized. Park "Xin Zhu" became the center for the development of high technology in Taiwan Region, with the main task of attracting foreign investment, experts, and scholars from different countries in this area. Monte Jade combined entrepreneurs, venture capitalists, and other service providers from the United States, Taiwan Province of China, and Asian countries.

In the Republic of Korea, a powerful impetus to the development of science and technology has also

been associated with the influx of foreign Koreans returning mainly from the United States in the mid-1970s. A special government programmer attracted a massive number of specialists. After training in leading universities in the United States, Korean scientists and engineers returned to South Korea. The government solved their employment problem by creating new research institutes. For example, in 1976, the Electronics and Telecommunications Research Institute (ETRI) was created in the field of industrial R&D. ETRI became a non-profit institution and the Government provided all of its financing. The Institute has successfully developed information technologies in areas such as microchips, semiconductors, high-end computers, digital mobile communication systems, and high-speed data transmission. ETRI was involved in the development and dissemination of knowledge and technology in the fields of information, telecommunications, electronics, broadcasting, information security, and information standardization. ETRI provided technical consultation and information to industries in the fields of information, telecommunications, electronics, broadcasting, and related technologies (Electronics and Telecommunications Research Institute (ETRI), n.d.).

Since 1994, the Korean Government has contributed to the creation of a special infrastructure for universities, research structures, and small and medium-size businesses, which were combined in a new network as participants of the innovation process. The mechanism of cooperation, including enterprise–university–research centers, ensured training human resources and support for enterprises that worked in the sphere of high technology. Much of this was because it was necessary to maintain a high international level of applied science given the growth in competition on the world market of high-tech products every year. Through such a mechanism, it was possible to exercise the commercialization of the most important developments throughout the country and hold leadership in a variety of industries. At the same time, relatively few jobs existed in Korea for academics with a degree. Moreover, the “brain drain” problem existed, with many graduates preferring to stay abroad—especially in the United States—after obtaining a degree. Then, the Government changed its attitude toward such professionals and began to consider them as useful external resources for collaboration. Training and the amount of time that young scientists spend abroad are treated as types of investments in human resources for the future. A higher number of opportunities for employment are available through the continuous scientific progress in Korea.

Additionally, from 1994, Taiwanese society implemented educational reform and began to create an educational innovative system aimed to prepare highly qualified specialists and increase Taiwanese universities’ competitiveness on the world stage. Three main areas were developed: attracting foreign students; providing opportunities for Taiwanese students to go abroad; and implementing international cultural and educational exchanges and cooperating with other countries. Students from 117 countries are trained in Taiwan Region.

The largest research center, ITRI, is actively involved in the process of knowledge internationalization. ITRI holds target internships for foreign professionals in its units with a view to forming joint scientific research, developments, and future joint commercialization. ITRI provides scholarships to foreign masters for training in doctoral studies at Taiwanese universities in specialties such as information technology, electronic engineering, optoelectronics, and photonics through further employment at ITRI. Students in the doctoral program must conduct joint research projects with ITRI laboratories.

Regarding Korean universities, Seoul National University is known for its high international level of talent preparation, along with the development and evolution of technologies in various fields of science. In 1998, the Government of the Republic together with national funds created a system of research institutions

to meet modern realities. For example, there are joint scientific research structures on the study of semiconductors and automation systems, and a joint research institute of energy and energy resources.

The Republic of Korea is a leader in the field of electronic technology and has developed the international community in this area through the globalization of e-learning. Since the beginning of 2000, South Korea has been able to actively attract foreign talent through the work of centers that support e-learning at universities and e-learning programs that include online lectures. The Republic of Korea implemented the national project “Digital Education” and has contributed to improving the quality of education through information and communication technologies, creating new teaching models.

At present, the Korean Government has developed the Education Development Project until 2030. This project aims to improve the quality of the education system in the Republic of Korea; gain recognition for Korean higher education institutions in the global community through the development of relationships between Korean universities and universities of other countries; create a favorable atmosphere in educational institutions, making them more attractive to both Korean and foreign talent; and allocate five billion won to the Scholarship Fund of the Republic of Korea. The project has the following tasks: attracting foreign teachers from around the world to Korean universities, including Nobel Laureates; introducing and disseminating “education for life” in the workplace; and increasing the number of educational institutions that provide supplementary education during a working career. During the final phase of this program (2020–2030), the Korean Government aims to cover 60% of the total number of country inhabitants through the continuous education system, increasing to 65% the proportion of women in the economic life of the country and including 10 Korean universities in the list of the best universities of the world. To achieve this aim, the Korean Government plans to allocate up to 1.1% of GDP to education reform.

4.1.2. Singapore

To create a knowledge-based economy, Singapore developed talent within its country and sought to attract talent from around the world, developing and perfecting a special system at the state and individual firm and organization levels. Given the assistance of the Singapore Talent Recruitment (STAR) Committee, the Ministry of Manpower, and the Economic Development Council, the Singaporean Government has implemented the strategic development of talent. An initially successful policy of attracting foreign professionals to Singapore and the use of foreign human resources enabled the leadership of the country to pass on searching for talent outside of its national framework.

Foreign labor resources have always played a significant role in creating the innovative capacity of Singapore, which has defined their quantity and quality. Because immigrants are a significant part of Singapore’s workforce (almost every second working individual is a foreigner), the policy on foreign workers took a separate direction. The Singaporean Government defined the requirements down to the level of professionalism of foreign workers, which was reflected in a three-tier system of foreign labor employment. Under this system, workers are assigned statuses depending on their qualifications and monthly income. However, despite a different policy toward “foreign workers” and “foreign talent”, the Singaporean Government has always emphasized equality regarding the valuable contributions of all immigrants in the development of Singapore.

“Foreign workers” are considered semi/unskilled workers in industry, construction, and services. Most “foreign workers” are immigrants from India, Bangladesh, Sri Lanka, the Philippines, and Thailand (Yeoh

and Lin, 2012). Foreigners possessing professional qualifications (such as managers) or graduate/scientific degrees are “foreign talent” (averaging 13.4% of the total number of non-residents). Usually, the most skilled professionals are from the United States, Britain, France, and Australia, as well as Japan and South Korea. In the late 1990s, the Government of Singapore, in connection with the intensive development of a “knowledge-based economy” and the lack of professional working researchers (technical specialists), liberalized immigration policies to facilitate obtaining permanent residence for qualified workers and launched various programmes to attract talent. Grant schemes for companies are the most popular among these programs. In this regard, Singaporean Government agencies, such as the STAR Committee, covered part of the cost of hiring skilled labor and participated in recruiting workers.

Currently, the foreign labor development policy in Singapore reflects the Government’s intention to increase the competitiveness of its innovative potential in the global market with the help of selecting talent, promoting a new knowledge economy, and having the best working conditions. Singapore actively organizes the transfer of scientific, technical, and management experience through scientific diplomacy and technological exchange carried out across borders by creating scientific, commercial, and government channels. These channels ensure cooperation and the exchange of experience, information, and resources, and promote a better understanding between countries and societies.

In connection with Singapore’s scientific and industrial potential entering the global market (1990s) and the creation of the first joint project with China—Suzhou Industrial Park—the Economic Development Council initiated the “software transfer” project. This project included sharing experiences between its technical specialists and those of China. Suzhou Singapore International School was founded within the framework of the project, which united students from more than twenty countries around the world.

The concept of “software transfer” was further developed through the adoption of the Plan of Science and Technology 2010 (Plan of Science and Technology, 2010). In this regard, the Agency for Science, Technology and Research (A*STAR), promotes science, engineering, and research in new industries; develops talent in the field of intellectual property; and contributes to increasing the popularity of science among young people. A*STAR also developed new approaches to human capital development—Pro-Foreign and Pro-Local. On the assumption that Singapore’s international relations with the world’s best scientific organizations through global talent have contributed to strengthening the country’s competitiveness, A*STAR launched a program: National Science Scholarships and A*STAR Graduate Scholarships (2001, 2003). National Science Scholarships supports the training of foreign and local students and graduate students in leading foreign universities through exchange programs and international study abroad programs, providing the opportunity to acquire practical experience at Singapore’s R&D institutes.

The A*STAR Graduate Scholarship (based on cooperation of the National University of Singapore and Nanyang Technological University) includes training doctors of sciences at national (Pro-Local) and international (Pro-Foreign) levels. This training occurs through a partnership between A*STAR and the best foreign universities, such as Imperial College (London, UK), The University of Illinois (Champaign, IL, USA), and the University of Dundee (Scotland, UK).

The transformation of Singapore into a world-class educational center is an integral part of forming the country’s innovative economy. Singapore actively attracted students from abroad, including from APR countries, the United States, and Europe. Cornell University and Duke University (in the United States) cooperated with the National University of Singapore and Nanyang Technological University. Attracting

foreign students enabled Singapore's educational system, research base, jobs, and financial benefits to be developed from the provision of international education services. In general, borrowing foreign experience in many areas and successfully adapting it to national features are characteristics of Singapore. Monitoring sponsored by subsidiaries of state institutions or private corporations of the study of the ground situation has become a main instrument of foreign experience transfer. The Government has invited the following best universities in the world to post their research centers to have a strong connection with production: Harvard Business School, Chicago Graduate School of Business, Massachusetts Institute of Technology, Cornell University, John Hopkins Medical School, New York Institute of Finance, Wharton Business School, and Georgia Institute of Technology.

Currently, Singapore seeks to create a tertiary international network of higher education, including world-class universities, main state universities conducting comprehensive R&D and training of the workforce, and private universities involved in teaching and applied research. In Singapore today, a tertiary sector of education exists that consists of branches of world universities—both public and private. Contact Singapore, a resource and information center, has contacts with nine branches in North America, the United Kingdom, Australia, and Asia. Contact Singapore engages in communication between global talent and Singapore by making available information on all sectors of the economy and career opportunities in Singapore; organizes activities for demonstrating educational and other programmers in Singapore and abroad; and manages offices abroad with the aim of attracting talented people.

4.2. Government Policy

The priorities of FDC government policies must conform to world trends, namely, increasing the value of high-tech industry branches with significant benefit by reducing the role of traditional resource-intensive industries. The main factor for sustainable economic growth is creating conditions for a transition to a knowledge-based economy through the decisive role of production, distribution, and use of knowledge and information. In practice, the government was the primary guarantee of FDC economic and social construction. The government encouraged the development of science and technology and created favorable conditions for participants in innovation processes to interact. In general, public and foreign investments and the government's policy of local and foreign business stimulation played a decisive role in the development of the economies of most FDCs. On the whole, an effective government economic strategy contributed to this process. The ruling regimes of FDCs had a special "development philosophy" and viewed society as a holistic body, evolving through certain laws. Such a body was not the subject of volitional dictatorial regulations, although the role of the government was coercive in the form of its strict directives. However, the rational view of economic problems has allowed FDC ruling regimes to correctly define priorities at every stage of development. At the same time, these regimes are able to accurately develop the overall strategic direction of economic growth and flexibly adapt new economic transformations to regional and world situations by adjusting rates and plans under changing conditions, especially under the circumstance of exiting from a financial and economic crisis. For example, after the crisis of 1997–1998, the Korean Government made significant efforts to open the country to trade and capital movements, restructure the financial sector, break up large industrial conglomerates, and increase the flexibility of the labor market.

Along with the macroeconomic process of economic restructuring, the government also promoted the strengthening of regional competitive advantages and the development of a knowledge-based economy.

At the same time, the state frequently intervened directly in the economic sphere, following specific cultural traditions. National security, stability, and societal harmony, as usual, were the highest policy goals of the FDC.

We can see the so-called informal market institutions. For example, there are specific “game rules” of horizontal communication or special relationships among enterprises, firms, and services, which are based on generally accepted social norms that reflect the traditions, customs, and mentality of the nations. As a rule, the specifics of FDC horizontal relations were connected with “Asian values” and the characteristics of Confucian ethics, which emphasized the subordination of individual interests to the collective good. Therefore, the government has played a significant role in the economic progress of FDCs and has affected horizontal relationships in the institutional sector. Political and administrative systems belonged to one group of people. At higher management levels, the backbone of politicians and civil servants of various ministries and councils ruled local corporations. After resignation from leadership positions, key people were sent to state-owned companies. Therefore, profitable political alignments, particularly for the government, determined the interactions of horizontal process participants and dictated certain behavioral styles.

In FDCs, fewer intermediaries exist between the government and businesses than in Western countries. Therefore, interaction and cooperation in the economic sphere were direct. Government intervention in pricing to stimulate the development of certain industries was perfectly valid. Production developed and expanded, not only for consumption but also to influence other countries and strengthen one’s own national security and autonomy (a number of FDCs adapted the Japanese model of economic development). Economic policies, often focused on long-term business development, capture and hold onto markets. Employment relationships were depoliticized. Compared with European countries, trade unions have not played an important independent role in the formulation of national economic policy. The government or companies controlled trade unions. However, frequently, the nature of employment relationships and the manner in which FDCs manage are competitive advantages that are allegedly criticized by Western countries (Strezneva, 2002, pp. 191–192).

4.3. *Foreign Investments*

It is widely accepted that economic development is primarily the result of investments in capital, labor, entrepreneurship, science, and technological innovation. FDIs play a special role in economic development and are connected with the modern global processes of the world economy. FDIs grew during the last decades of the twentieth century and the beginning of the present century, with the exception of during the crisis of 2008–2009. The rate of FDI growth is testimony to the dynamic development of the world’s investment processes. An increase in FDI is a significant factor for FDCs. As a rule, FDIs of larger firms are strategic factors for reducing production costs in developing countries or penetrating markets in developed countries. Therefore, FDIs are considered a company’s foreign business activity. In this regard, there are some stages of business internationalization and types of companies: exporters, international activities, multinational operations, and global operations. Regarding FDC FDI, such as in South Korea, large companies usually accompany the direct investments of small and medium-size supply enterprises. Many cooperative supply firms have direct investments in foreign countries: they are firms with either their own technology advantages or that utilize cheap labor and other cost-reduction factors in the host country. A considerable number of Korean firms consider cooperation through FDI with foreign customers or

competitors as significant. Inbound FDI in South Korea has played only a minor role in total investments, but has increased particularly after the financial crisis of 1997–1998. Outsourcing activities with foreign competitive firms and FDI contributed to technology transfers, increasing global networks, and gaining competitive advantages for firms in Korea's industrial clusters (Dunning, 2000, p. 345).

FDI and the government policy of local and foreign business stimulation have led to long-awaited economic success and have contributed to breakthroughs in macroeconomic progress. Therefore, given massive foreign investments, Thailand has been transformed from an agrarian country into an industrial one. Thailand has focused on technology transfers through FDI. The rapid income growth from exports of finished products was the result of a consistent policy of the Thai Government that aimed to establish new industries with the assistance of foreign capital and the most advanced foreign technology. Investments and export of finished industrial products (electronics, textiles, and computers) became the “locomotive” of Thailand's economic growth. The special Investment Office has initiated a number of laws aimed to attract foreign capital and technology, and processing applications for permission to open joint ventures has been simplified. Some benefits were introduced for entrepreneurs who use production with modern technology that has a minimal impact on the environment or projects aimed to develop certain regions in Thailand. The policy to attract foreign investments has established for Thailand the reputation of being a reliable business partner. Japan, the United States, Hong Kong (HKSAR of China), and Taiwan (Province of China) became donors to Thailand's economy. Japan was the leader of this process (accounting for one-third of all investments). Then, investments decreased because of poor infrastructure, high wages, and a shortage of specialists.

However, the best country for investing in industry is Singapore. The Special Economic Development Board has contributed to the establishment and development of special industrial zones and to attracting foreign investors to industry. The Singaporean Government adopted Japan's experience in the field of export-oriented industry establishment, including the acquisition of patents and licenses. Originally, the newest technology combined with relatively cheap labor and creating jobs through the promotion of labor-intensive industries have become a priority. This policy has led to the intensification and creation of high-tech production. Singapore made a bet on investments in new export-oriented labor-intensive production, and such attempts were made through links with companies based in the United States, such as General Electric, Hewlett-Packard, American Optical, Timex, Bethlehem Steel, GTE, and others (Schein, 1997, p. 47). As a result, to attract investors and engage in joint project development, foreign centers in Hong Kong and New York were opened. The government paid special attention to studying the world market and identified more profitable sectors to develop Singapore's industry in accordance with criteria such as cost-effectiveness, product demand, and the degree of production capitalization.

Because of a certain investment and export dependency from the United States and some developed countries, FDCs' national economy had a small number of sectors and determined production success in, for example, electronics. The situation was very dangerous. Therefore, the challenge of increasing the number of national economy sectors to provide for the greatest success was a priority. In connection with this challenge, the Malaysian Government of Mahathir Mohamad expanded the productive sector and ensured the development of the high-tech industry. Government actions have contributed to an increase in GDP and articles for industrial export, as well as decisions on employment problems. Gradually, given new scientific developments, the production base grew.

In Singapore, industrial products became more complex and included computer hardware, computer equipment, software, and silicon boards, ensuring the attraction of new investments. Mainly, there were investments in electronics and a diversification of production as a whole. Even in the face of economic downturns, export performance improved considerably. The Government of Singapore stated that the country was moving into the “second industrial revolution” and assigned the task of developing knowledge-based production based on R&D not only in the field of computer software but also engineering projecting (Huff, 1994).

The Government of Singapore and the National Wages Council have embarked on a policy of high wages to accelerate the transition from traditional labor-intensive manufacturing with low wages to the production of high-tech products with high wages. In practice, the increase in wages in Singapore has led to higher business costs. For example, after a decline in demand for semiconductors and electronic products in the United States, there was a sharp decline in demand for accessories and spare parts produced in Singapore. Therefore, the financial and telecommunication sectors gradually became the main engines of Singapore’s growth. The promotion of local businesses and the integration of Singaporean enterprises with multinational companies for greater access to the export markets of goods and services were policy priorities. Much of this was the result of the fact that, unlike South Korea and Taiwan Province of China, whose industrial growth was stimulated by local small and medium-size enterprises, the development of Singapore’s industrial sector still depended mainly on transnational corporations. With the transition to an export-oriented industrialization model, chemical, electronics, and petroleum refining industries were the most intensively developed in the production sector. Subsequent development included biomedicine, which was associated with alternative water sources and accurate engineering—in particular, equipment for environmental cleanup. However, electronics output declined slightly, although this segment represented approximately 25% of national production and was dominated by the manufacture of computer peripherals and refining equipment (Nah, 2005).

Through an active investment policy at both the regional and subregional levels, FDC economics—along with stronger economic growth and no structural changes—flexibly adapted to the processes of globalization and integration. Therefore, Singapore, Malaysia, and Thailand have continued efforts to promote and protect a variety of investments, harmonize all favored conditions with one another, and provide safeguards against discrimination through special treaties. This development is relevant because, with the exception of Singapore, Malaysia, and Thailand had not actually carried out large-scale mutual investments. Singapore had advantages in financial and technological aspects but also experienced a labor shortage. Malaysia and Thailand were rich in natural and labor resources but also faced limited financial sources. Agreements and understandings also defended countries’ firms from possible expropriation, safeguarded the free movement of capital, and resulted in monetary gains. These states were to simplify procedures for investment activities and to make appropriate arrangements and laws that regulate foreign investors’ activity in a clearer and more consistent manner.

In particular, the function of the ASEAN Free Trade Area (AFTA) and further tariff reductions were linked directly with FDC investment potential and foreign investors. In accordance, FDC investors had a series of privileges: a three-year exemption from corporate income taxes or a 30% tax rebate on investments; full ownership for foreign investors and at least 30 years of industrial property rent; access to the internal market; opening of the manufacturing sector for investments; and duty-free importation of capital for investments.

5. Conclusions

The active policy to attract foreign investments and increase the share of the knowledge-based economy and innovation-oriented enterprises, and the establishment of a mechanism to ensure the rational use of innovation and human resources (talent), were the main vectors of FDC economic growth. A knowledge-based society and a knowledge-based economy were formed on the basis of highly trained competitive professionals and were connected directly to the competitiveness of the national education system and its internationalization in the face of global peace. In this regard, in most cases, FDC governments sought to develop not only the talent within their countries but also to attract talented young people, technicians, and academics from all over the world through the creation of favorable conditions and economic proposals.

The development of high-tech industries connected with the use of a new high technology determined the overall situation in the world economy. A high degree of FDC involvement in the world economic system, interdependence, and fierce competition led to the creation of vast economic and scientific ties. Most of the FDCs, especially Singapore, Malaysia, and Thailand, easily overcame the effects of the Asian financial crisis of 1997–1998 and the economic and financial crisis of 2008, as if they had not been affected. In many ways, this was the result of not only the financial assistance of international financial institutions (except for Malaysia, which itself came out of the crisis in 1997–1998) but also of concrete government actions. After the 1997–1998 and 2008 crises, FDC contributions to competitiveness and innovation capacity, and their stronger integration into the world economy as major centers of science and technology not only in the APR but also globally, became more elaborate through national innovation systems development. As a result, Singapore, South Korea, and Taiwan Province of China can be considered developed industrial countries on most parameters, and Malaysia and Thailand have recently been attributed as FDCs.

The growth dynamics of South Korea, Singapore, Taiwan Province of China, Malaysia, and Thailand enhance competition and enable these countries to represent serious challenges to developed countries. Such dynamics also represent a certain impetus for the transformation of the international division of labor into a new stage.

Conflicts of Interest: The authors declare no conflict of interest.

References

- Acharya, A., 2008. *The Rise of Asia: Who Takes the Lead*. Palgrave, London, UK.
- Amyx, J., 2004. *A Bond Market for East Asia? The Evolving Political Dynamics of Regional Financial Cooperation—Pacific Economic Papers No. 342*. Australia-Japan Research Center, Australian National University, Canberra, Australia.
- Ando, M., Kimura, F., 2003. *The Formation of International Production and Distribution Networks in East Asia*. Working Paper 10167, National Bureau of Economic Research, Cambridge, MA, USA.
- Beeson, M., 2007. *Regionalism and Globalization in East Asia*. Palgrave Macmillan, London, UK.
- Bowie, A., Unger, D., 2002. *The Politics of Open Economies: Indonesia, Malaysia, the Philippines and Thailand*. Cornell University Press, Ithaca, NY, USA.
- Chang, L., Ramkishan, R., 2001. The economics and politics of monetary regionalism in Asia. *ASEAN Economic Bulletin* 18, 103–118.

- Dosch, J., 2006. *The Changing Dynamics of Southeast Asian Politics*. Lynne Rienner Publishers, Boulder, CO, USA.
- Dunning, J.H. (Eds), 2000. *Regions, Globalization, and the Knowledge-Based Economy*. Oxford University Press, Oxford, UK.
- Electronics and Telecommunications Research Institute (ETRI). Available online: <http://www.etri.re.kr/> (accessed on 1 March 2017).
- Giround, A., 2004. Foreign direct investment and the rise of cross-border production networks in Southeast Asia, in: Freeman, N.J., Bartels, F.L. (Eds), *The Future of Foreign Investment in Southeast Asia*. Routledge, London, UK.
- Haas, M., 1989. *The Asian Way to Peace: A Story of Regional Cooperation*. The University of Hawaii Press, Honolulu, HI, USA.
- Henning, C.R., 2002. *East Asian Financial Co-operation*. Institute for International Economics, Washington, DC, USA.
- Huff, W.H., 1994. *The Economic Growth of Singapore. Trade and Development in the Twentieth Century*. Cambridge University Press, Cambridge, UK, pp. 330–331.
- Konstadakopulos, D., 2002. The challenge of technological development for ASEAN: Intraregional and international co-operation. *ASEAN Economic Bulletin* 19, 100–110.
- Lawrence, R., 1995. *Regionalism, Multilateralism, and Deeper Integration*. Brookings Institution Press, Washington, DC, USA.
- Lian, D., 2002. Asia Pacific: Don't Count on an Imminent Revival of ASEAN. *Global Economic Forum, The Latest View of Morgan Stanley Economists*. Press Statement by the Chairman of the 8th ASEAN Summit, The 6th ASEAN+3 Summit and the ASEAN-China Summit, Phnom Penh, Cambodia, 4 November 2002.
- Litsareva, E., 2001. *Contemporary History of the Asia and Africa Countries. 1945–2000*. Tomsk University Publishing House, Tomsk, Russia.
- Litsareva, E., 2004. *Economic Integration on the European Continent and at the Asia-Pacific Region in the Second Half of the Twentieth Century*. Tomsk University Publishing House, Tomsk, Russia.
- Litsareva, E., 2007. Asia-Pacific science and technology development as a factor of regional integration and globalization of the world economy, in: Deriglazova, L., Shuhra, A., Fritsch, S. (Eds), *EU and Russia: Face to Face. Materials of the International conference*. Tomsk State University Publishing House, Tomsk, Russia.
- Meyer, A., 2001. Technology transfer to China: Preparing for a new era. *Science* 9, 43–52.
- Nesadurai, H., 2003. *Globalization, Domestic Politics and Regionalism: The ASEAN Free Trade Area*. Routledge, London, UK.
- Controller General of Accounts, Department of Expenditure, Ministry of Finance, Government of India, 2004. *Materials of the Institute of Government Accounts and Finance. ITEC/SCAAP Training Programmer on Public Expenditure Management, 6–17 December*. Available online: <http://cga.nic.in/writereaddata/file/training%20HR/Induction%20Material/InductionMaterial24082016.pdf> (accessed on 1 March 2017).
- Nah, S.L., 2005. Singapore's Manufacturing Sector 1991–2005. *Statistics Singapore Newsletter, Planning Division, Economic Development Board*. Available online: https://www.singstat.gov.sg/docs/default-source/default-document-library/publications/publications_and_papers/manufacturing/ssnmar06-pg7-11.pdf (accessed on 1 March 2017).
- Niels, B.S., 2007. The direct material inputs into Singapore's development. *Journal of Industry Ecology* 11, 117–131.
- Yeoh, B., Lin, W., 2012. Rapid Growth in Singapore's Immigrant Population Brings Policy Challenges: Migration Information Source. Available online: <http://www.migrationinformation.org/Profiles/display.cfm?ID=570> (accessed on 1 March 2017).
- Youn-Suk, K., Hyeng Keun, K., 1997. Asia-Pacific region in changing global economy. *Human Systems Management* 16, 285–291.
- Onitsuka, T., 1999. Japan/ASEAN TQM project. *The TQM Magazine* 11, 41–45.
- Pang, E.H., 1982. Foreign labor and economic development in Singapore. *International Migration Review* 16, 549–553.
- Ministry of Trade and Industry, 2010. *Sustaining Innovation Driven Growth. Plan of Science and Technology*. Available online: <https://www.mti.gov.sg/ResearchRoom/Documents/app.mti.gov.sg/data/pages/885/doc/S%20And%20T%20Plan%202010.pdf> (accessed on 1 March 2017).

- Inland Revenue Authority of Singapore, 2008. Property Tax Acts. Available online: <https://www.iras.gov.sg/irashome/Quick-Links/Tax-Acts/Property-Tax-Act/> (accessed on 1 March 2017).
- Schein, E.H., 1997. Strategic Pragmatism. The Culture of Singapore's Economic Development Board. MIT Press, New York, NY, USA.
- Strezneva, M., 2002. The international society of business entities. *Pro et Contra* 7, 181–195.
- Sum, N.L., 1996. The NICs and competing strategies for East Asian regionalism, in: Gamble, A., Payne, A. (Eds), *Regionalism and World Order*. Macmillan, London, UK.
- Thant, M., Tang, M., Kakazu, H. (Eds), 1995. *Growth Triangles in Asia: A New Approach to Regional Economic Co-operation*. Oxford University Press, Oxford, UK.
- Tongzon, J., 2002. *The Economies of Southeast Asia. Before and After the Crisis* (2nd ed.). Edward Elgar Publishing, Cheltenham, UK, Northampton, MA, USA.
- Zainal-Abidin, M., 2000. Implications of the Malaysian experience on future international arrangements. *ASEAN Economic Bulletin* 17, 135–147.
- Watkins, T., 2002. *Economic History of Singapore. How Singapore Came to Develop Its High-Tech Industry*. San Jose State University, Economics Department. Available online: <http://www.sjsu.edu/faculty/watkins/singapore.htm> (accessed on 1 March 2017).