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The Changing Pattern of Japanese Foreign Direct Investment Models in Europe (especially CEE) as a Consequence of the Globalization and the Development of the Knowledge – Based Economy

Abstract

The article presents model of Japanese investments and flows of foreign direct investment from Japan. The ongoing globalization process has forced a quest for new region as locations for Japanese FDIs. Japanese investment flow to the Central and Eastern Europe uses a secondary path-i.e. by way of Western European division. The example of Poland demonstrates that this manner of investment is dominant. Japanese FDIs facilitate the creation and development of a knowledge-based economy.

1. Introduction

The question of the position of great economic superpowers remains extremely current at the dawn of the 21st century—the age of the global economy. Presenting one of them—Japan—seems interesting. There is no argument regarding the fact that from the mid–20th century right up to today, Japan, together with the United States and the European Union, forms what is known as the "Triade," the core of the world economy. This paper is intended to demonstrate the flow of foreign direct investment (FDI) from Japan, one of the largest exporters of capital to Europe.

The objective of this work is to show Japanese FDIs in Europe (including Central and Eastern Europe) and their changes (decreases in flows) under the influence of progressing globalization processes.

This paper is made up of five sections that endeavor to answer the following questions:

- How has the globalization process influenced Japanese FDIs in the countries of the European Union and has it changed the model of Japanese investment?
- Has joining the European Union by the countries of Central and Eastern Europe attracted Japanese investors to them?
- Are location–related conditions in the countries of Central and Eastern Europe competitive for them? Why are Japanese investments in the countries of Central and Eastern Europe so small? What barriers do Japanese investors meet?
- Why do Japanese investments flow to the countries of Central and Eastern Europe by way of a secondary path—i.e. through Western European divisions—and why is this form of investment dominant?
- What is the role of Japanese foreign direct investment in creating and developing the knowledge–based economy?

2. The Japanese FDI Flows into Europe: The Scale of the Phenomenon

The overall sum of foreign direct investments originating in Japan is shrinking. However, the countries of Europe remain one of the largest recipients of Japanese investments. The countries of the European Union absorb almost the entire stream of investments flowing into Europe. Hence, their dominant position as a receiver of Japanese investment. Detailed data are contained in Table No. 1. The countries of the European Union absorbed streams of Japanese FDIs that initially decreased as of 1991, but successively increased from year to year from 1994 to 1999. The greatest stream of Japanese investments flowing into Europe and the European Union was in 1999. The growth dynamic of invested amounts over this period was impressive, where the figure for Europe for the year 1999 was 2,856 trillion yen and 2,647 trillion yen for the following year. The amounts decreased as of that year and no longer achieved that high a value. Since then investment is demonstrating a downward trend. It only reached a level of 1,288 billion yen in 2001. The significant fall in amounts invested by Japanese investors in this region is visible. New OECD data

(investment stated in USD) confirms this and shows that direct investment flowing from Japan in they year 2002 amounted to only $381.5 billion. However, data from 2005 points to interest in this region: The sum of Japanese investments grew to over $598 billion.

Table 1. Japanese FDI Directed to Europe in the Years 1991–2002 (millions yen)

Year	Europe*	European growth (%)	European Union	European Union growth (%)	Japanese FDI share in the EU in Japanese FDI in Europe (%)	European Union (15) total (million USD)
1991	1225295	—	1192343	—	97.31	
1992	877063	-28.42	847929	-28.88	96.68	103005
1993	854641	-2.56	797494	-5.95	93.31	92854
1994	**622070**	-27.21	**616038**	-22.75	99.03	120345
1995	806300	+29.62	794600	+28.99	98.55	158573
1996	830600	+3.01	804500	+1.25	96.86	181777
1997	1374900	+65.53	1344100	+67.07	97.76	223433
1998	1793700	+30.46	1773000	+31.91	98.85	418807
1999	**2856800**	+59.27	**2809700**	+58.47	98.35	736162
2000	2647900	-7.31	2642400	-5.95	99.79	940528
2001	1288200	-51.35	—	—	—	433381
2002	1800000	+39.73	—	—	—	381561
2003						384706
2004						398942
2005						598986

* Europe = EU + EFTA + other European countries.

Source: Study based on: Japan – Direct Investment Abroad: Outflows by Country, International Direct Investment Statistics Yearbook 1991–2002, OECD 2003, p. 223 and Outflows of Foreign Direct Investment -www.oecd.p4.siteinternet.com (January 14, 2008).

The countries of the European Union are the second largest, after the United States, recipient of Japanese investments. The greatest stream of Japanese FDIs was registered over the years 1997–2000. Table 2 presents detailed data. The greatest stream of Japanese FDIs over recent years is directed towards France, Denmark, and Great Britain. France received 435.6 billion yen in 2002. In 1999, Denmark received a record level stream of Japanese investments for that country – 1,155.6 billion yen. In the year 2000, Great Britain noted the largest Japanese investments on its territory – 2,115.6 billion

yen. In the year 2002, investments did not exceed 531.4 billion yen in the individual countries.

Japanese investments in individual European Union countries were as follows:[1] In Great Britain in 1998 they achieved 24% of total Japanese investments as compared with a 17.6% share in those investments in 1999. This was followed by an upward trend where the highest share was 39.9% in the year 2000. This share in the total sum of all of Japan's foreign direct investments fell over successive years reaching 12.4% in 2001 and 12% in 2002.

Investments in Spain and Italy are not large. There, Japan invests the least from among all the countries of Western Europe.

Investments in Germany are at an average level for the countries of the European Union. The share of these investments in European Union investments as of 1998 (1.4%) had a downward trend where through the year 1999 it reached 1% all the way to the year 2000 when it achieved a 0.7% share, The year 2001 was a breakthrough year when the share of investments from Japan rose to 1.3%, but they again fell to 1.1% in 2002.

Investments in France also lacked a balanced trend and fluctuated over individual years. In 1998 the share was 1.3%, which grew to 1.7% in 1999. The following year this share decreased to the lowest level of 0.7%. It grew slightly to 1% in the year 2001, reaching its highest share of 9.9% in 2002.

Table 2. Japanese FDI Made in the Countries of the European Union over the Years 1991–2002 (million yen)

Year	France	Netherlands	Great Britain	Italy	Belgium – Luxembourg	Ireland	Germany	Spain
1991	109887	263620	482586	**43309**	65636	13719	**149968**	50841
1992	57762	183165	373423	27361	44208	14314	97409	42054
1993	60593	241817	280952	20902	19901	52143	84497	23014
1994	42732	107342	221737	17584	89145	35065	74321	18810
1995	156100	143900	333200	11900	45600	34300	53000	4900
1996	56600	123800	387300	12300	56900	44800	64300	35800
1997	213000	404300	505400	17100	14300	69500	89800	28500
1998	66600	271100	1252200	14000	25400	46200	70800	15600
1999	125700	**1155600**	1307000	5200	18300	51300	72400	**57800**
2000	36000	304700	**2115500**	6400	43200	5400	35300	3600
2001	38600	563900	495500	2800	84500	15400	52300	5300
2002	**435600**	364000	531400	24900	**221800**	**136600**	46500	14100

Source: Study based on "Japan – Direct Investment Abroad: Outflows by Country," *International Direct Investment Statistics Yearbook 1991–2002*, OECD 2003, p. 22.

[1] Own calculations.

The countries of Central and Eastern Europe absorbed relatively little in terms of quantities of Japanese investments. The record stream of Japanese FDIs belongs to the Czech Republic, where it amounted to 16.6 billion yen in 2002. Hungary received the most Japanese investments in the year 2000 – 15.9 billion yen. Poland, for its part, registered the largest stream in 1999 – 10.5 billion yen. Romania achieved the highest stream in the year 2001, amounting to 1.7 billion yen. The Ukraine and Slovakia received minimal Japanese investments. Detailed data are presented in Table 3A. The newest OECD data show growing interest in this region by Japanese investors over recent years. The Czech Republic, Hungary, and Poland are the largest recipients of these investments.

Table 3A. Japanese FDI Made in the Countries of Central and Eastern Europe over the Years 1991–2002 (million yen)

Year	Czech Republic	Hungary	Poland	Romania	Slovakia	Ukraine
1991	…	24345	269	…	…	…
1992	507	507	…	…	…	…
1993	778	8005	778	…	…	111
1994	…	4191	307	…	102	…
1995	5300	3300	300	200	…	…
1996	…	1500	1100	…	…	…
1997	3000	10100	8200	600	…	…
1998	2800	3600	6800	1500	…	…
1999	300	7000	**10500**	900	…	300
2000	5700	**15900**	2900	…	…	…
2001	10500	4700	1700	**1700**	…	…
2002	**16600**	5800	2000	…	…	…

Source: Study based on "Japan – Direct Investment Abroad: Outflows by Country," *International Direct Investment Statistics Yearbook 1991–2002*, OECD 2003, p. 222. Fields marked "…" in the table signify a lack of investment in the given year.

Table 3B. Japanese FDI Made in the Countries of Central and Eastern Europe over the Years 1992–2005 (million USD)

Year	Czech Republic	Hungary	Poland	Slovakia
1992	…	…	13	…
1993	90	11	18	13
1994	120	48	29	18
1995	37	59	42	43
1996	153	-4	53	63
1997	25	462	45	95
1998	127	278	316	147
1999	90	250	31	-377
2000	43	620	16	29
2001	165	368	-90	65
2002	206	278	230	11
2003	207	1644	300	13
2004	1014	1122	778	152
2005	856	1346	1455	146

Source: Study based on "Outflows of Foreign Direct Investment," www.oecd.p4.siteinternet.com (January 14, 2008). Fields marked "…" in the table signify a lack of investment in the given year.

3. The Impact of the Asian and Economic Crises in Japan on a Decrease in Japanese FDI Flows into Europe

There is a clear slowdown of economic growth in the developed countries visible for the past couple of years. Almost all major economies developed more slowly than smaller ones. What seems to be of greatest importance is growth in unemployment, the weakening rate of investment, and, as is the case in Japan, deflation. This applies to all the major economic powers of the world. Recession in the Japanese economy started in December of 1991 with the "bubble burst." The Japanese economy went through a major financial breakdown in 1992 as a result of the crisis of the Japanese financial system. A second major breakdown in 1997–1998 was tied to recession in the Eastern Asia region.

The crisis in this part of the world started in 1990 in Japan. The yen started to grow stronger with respect to the USD at the start of the nineteen–

nineties. It made gains of 81% from 1994 to April of 1995 (Świderek 1998). In trying to maintain the competitiveness of their merchandise, Japanese companies started to look for ways of lowering production costs. It is for this reason that they transferred it to the countries of Southeast Asia. This invigorated the economy in such countries as Malaysia, Thailand, Indonesia, and the Philippines.

The yen started losing value with respect to the USD starting with April of 1995. This resulted in a decrease in Japanese investments. In 1995 the countries of the region also started having their first problems with servicing their very significant debt. These countries compensated for the outflow of FDI with credit taken out in USD. The share of domestic capital in investments also increased. In Malaysia as in the other countries of the region, it turned out that many newly undertaken recent investment projects missed their mark—e.g. loans granted private companies for capital investments (including the financing of purchases of shares in companies that were already active as well as new created ones, investment in the construction industry, and in the real estate market).

Japan effectively climbed its way up the ladder of industrial development. The result of bank loans took the form of a "bubble economy" over the years 1987–1990 as well as today's extended banking crisis, which is linked to "bad debts." Rapid industrial development resulted in enormous trade surplus, the sudden appreciation of the yen that is known as *endaka* in Japan, and the major outflow of FDI.

The most important reason for recession in the Japanese economy was Japan's malfunctioning banking system against a background of world financial markets. The most important quality of the banking system of Japan was its orientation at group interest. Japanese banks not only provide financial services, but also serve as the primary entity in the group to which they belong. These groups are remnants of the *zaibatsu* and *keiretsu* system of interlinked entities representing several sectors of the economy together with the dominant role played by a major bank. Informal links between state officials, companies, and banks also played an important part. Subject to such conditions, there was no market competition. What emerged was a protectionist system. The main banking system was organized by the *keiretsu* formation with stress on mass collaboration not only internally between the *keiretsu*, but also between the *keiretsu* and the government. The *keiretsu* was a tool thanks to which the state could direct capital to investment projects that were in line with implemented industrial policy (Ozawa, pp.9–10). An important factor not only in Japan, but also in other Asiatic countries, was excessive debt in foreign currencies caused by the long–term maintenance of exchange rates at levels defined by the authorities of specific countries. These factors are why the undertaken

liberalization of capital flow turned out to be premature, as the countries were not ready.

The great banking crisis that touched the countries of the Asia region in the years 1997–1998 demonstrated the need for change. This primarily applied to banking supervision, but also transparency in the operations of the managements of companies and banks tied with family conglomerates hiding behind family secrets. In Japan, where the ownership of large conglomerates was not in the hands of families (after World War II), long–term links and cross–ownership of shares predetermined the conducting of business.

The Japanese model of a fine–grain shareholder structure with minority capital links within the financial–industrial group was created in order to effectively protect Japanese companies against takeover by foreign entities. The process of reforming the financial sector has presently been commenced in the economy. Nine municipal banks have been merged into the structure of four powerful financial groups. Each of them was included on the list of the ten largest financial institutions in the year 2000 in terms of world financial institution assets. They are the Mizuho Financial Group, the Sanwa–Asami–Tokai Bank, the Sumimoto Mitsui Ranking Corporation, and the Mitsubishi Tokio Financial Group (Szołtun 2002, pp. 77–78).

In addition to an inefficient financial sector, another problem for Japan was the appearance of virtual capital and its abstract economic processes. This resulted in numerous controversies, including the phenomenon of winding up the market situation by such capital with its related violent crises.

A significant quality of current changes taking place in the operations of Japanese banks is rather universal limited presence on foreign markets.

4. Changes in Conditions for Japanese Investment and the Japanese Investment Model as Influenced by the Globalization Process

Japanese FDI was possible thanks to research and development, which during the postwar years was almost completely dependent on the absorption and adaptation of Western technology—both product technologies and technological processes. This was made possible through licensing agreements. The present phase of development of the Japanese economy—the "McLuhan" phase according to Terutomo Ozawa—rules out the existence of *keiretsu* links. Japan wanted to catch up to industries manufacturing technologically advanced goods, especially information–related ones, in the United States (new computer technologies, miniaturization and the setting up of equipment networks and

computer equipment, and primarily the establishing of an international Internet network).

Unfortunately, as was stressed, the bubble burst in 1990 as a result of the crisis in the financial system in Japan driven by bank loans for companies. Thus ended the process of accelerated economic growth. Long–term stagnation occurred. Japanese industries found it hard to catch up to new technology while simultaneously protecting and controlling the financial, telecommunication, and distribution sectors, as had been the case to date. The *keiretsu* system began to be a significant hindrance to further Japanese FDI development. Economic reform as well as reform in managing transnational corporations seemed inevitable. However, this was blocked by governing spheres belonging to the Liberal Democratic Party of Japan, tied to old, staple industries from previous development phases that.

Contradictions made their appearance in the *keiretsu* links themselves. Being closed systems involved in the control of information they failed to keep up with modern trends and the passage into a new IT era (Ozawa 2003, pp. 17–18). *Keiretsu* practices resulted in closed information systems and information control. The IT revolution required deregulation and an open and transparent system. What is most important, it required the promotion of a free flow of information.

The most significant factors influencing the poor condition of the Japanese economy were (Krugman 2001, p. 84) friendly relations between government and business, where such cooperation is known as "crony capitalism," the granting of cheap credit by banks, and the benefiting from government guaranties by their related companies.

5. The Competitiveness of the Central and Eastern European Countries for Japanese Investors

Japan is successively trying to increase the stream of its investments in this region as the competitive advantages of the countries of Central and Eastern Europe as locations seem quite significant. They include strategic geographical location, entry into the European Union, the size of the internal market and its growth potential, proximity to sales markets, and relatively inexpensive (compared with Western Europe) as well as qualified work force.

The "World Investment Report 2004" demonstrates that Poland, the Czech Republic, and Hungary are the three larges recipients of FDI in Central and Eastern Europe. Less than USD 1,900 fall to the average Pole, where in the

case of a Czech the figure is 3,900, 2,300 for a Hungarian, and 2,000 for a Slovak (Bonek 2005). Japanese investments in Poland are twice as small as in Hungary and three times as small as in the Czech Republic. Japanese companies invested USD 512.5 million in Poland by the end of 2001, where the figure for the Czech Republic was USD 1.59 billion and USD 1.1 billion for Hungary. On a *per capita* basis, Japanese investments in the Czech Republic are fifteen times larger than in Poland, and ten times greater in Hungary (Inwestycje japońskie w Polsce są… 2002).

Rankings published by the World Economic Forum, including the "Global Competitive Index" (GCI) for 2003–2004, graded 102 countries. Hungary, the Czech Republic, and Poland improved their positions with respect to the previous year, occupying 33rd, 39th, and 45th place in the ranking respectively.

Factors with a negative impact on Poland's position are:

1. Public institutions.
2. Legal regulations (57% of foreign investors consider Polish law to be internally inconsistent and containing numerous gaps, which results in regulations being variously interpreted by businesses and government offices).
3. Frequent changes to legislation.
4. Corruption (46% of investors are of the view that this practice warps competition, where the phenomenon is primarily the result of a faulty legal system).

Positive factors also influence the position occupied by Poland in the technology ranking (34th place) and in the macroeconomic environment ranking (49th place).

Motives for undertaking FDIs by Japanese investors in Poland in the year 2000 may be subdivided into grades of importance (Garlicki, Błuszkowski 2000):

Grade 1 – Extremely important factors. This group includes factors whose importance raises no controversy:

1. Poland's membership in NATO (71.4%).
2. The cost of labor, labor supply, and labor force qualifications (57.1%, each).
3. The potential for reducing production costs, favorable conditions for activities by investors, legal security, and Poland's chance to be a member of the European Union (42.9%, each).

Grade 2 – Important factors. This group includes factors that received somewhat more ratings as being very important as opposed to being unimportant:

1. The size of the Polish market, favorable conditions for activities by investors, legal security, and the functioning of the banking system (57.1%, each).
2. Perspectives of economic growth (42.9%).

Table 4. Motives Behind Undertaking Japanese FDI in Poland in the Year 2000 (%)

Factors	No importance	Minor importance	Medium importance	Extreme importance
Perspectives of economic growth	0.0	28.6	42.9	28.6
Labor costs	14.3	0.0	18.6	57.1
Size of the Polish market	0.0	28.6	57.1	14.3
Labor supply	14.3	0.0	28.6	57.1
Potential for reducing production costs	14.3	14.3	28.6	42.9
Labor force qualifications	14.3	0.0	28.6	57.1
Favorable conditions for investor activities	0.0	0.0	57.1	42.9
Legal security	0.0	0.0	57.1	42.9
Chances of Polish EU membership	14.3	28.6	14.3	42.9
The functioning of the banking system	14.3	14.3	57.1	14.3
Poland‘s NATO membership	28.6	0.0	0.0	71.4

Source: Study based on Garlicki J., Błuszkowski J., *Opinia inwestorów zagranicznych o społecznych i ekonomicznych warunkach działalności w Polsce* [The views of foreign investors on social and economic conditions for operations in Poland], Parts 1 and 3, PAIiIZ, Warsaw, 2000.

Commissioned by PAIiIZ, studies conducted by the INDICATOR Marketing research Center on 707 companies operating in Poland in the year 2003 showed the main factors influencing decisions regarding business operations. Factors most frequently mentioned were perspectives of economic growth, market size, low labor costs, potential for reducing production costs, labor supply, labor force qualifications, prices level, and planned entry into the European Union. The first two factors were very important in the study as they received over 60% ratings as being extremely important and 25% as medium important.

The same study carried out on 706 companies (from the United States, Great Britain, Germany, France, and the Netherlands) at the end of the year 2005 demonstrated that the most important factors influencing the undertaking of business in Poland are the size of the Polish market, labor costs (68.7% of investors deemed this factor as important, while 48.2% considered it very

important), perspectives of economic growth, labor force qualifications (84.8% important and 49% very important), and labor supply.

6. The Entry into the European Union by the Countries of Central and Eastern Europe

The results of the INDICATOR study for the year 2005 point to a positive impact of Poland's accession to the European Union on entities with foreign participation. Almost three–quarters of investors are of the view that Poland's incorporation into European structures worked to improve their operating conditions. The greatest benefit that investors see as stemming from Poland's entry into the European Union is the harmonization of domestic law with European Union regulations. This factor is identified by over one–half (50.4%) of examined companies. Next in order are simplified procedures related to supplying merchandise to European markets (35.7%) and the eradication of customs duty (35.5%).

The process of catching up to the developed countries is the main starting point for the successful integration of the new European Union member states. It is by way of FDIs that the structures of Central and Eastern European economies are improved, economic productivity grows, and they go on to a higher level – "catching up" to the countries of the European Union. FDIs have an important role in industrial restructuring and productivity growth processes in countries that have recently become European Union members (Damian, Rojec). The Flying Geese model argues that a less developed economy is capable of taking off through trade and pro–trade oriented FDIs, depending on the current level of the leading country. The process of catching up takes place through trade and FDIs. It is through FDIs that the leading country brings technology and moves lower level technology industries to less developed countries (Ozawa 1992, pp.27–54). This is the case in the countries of Central and Eastern Europe that are absorbing most of the investments of the European Union.

The countries of Central and Eastern Europe are gradually accepting certain industries from the European Union (15) thanks to FDIs. The comparative advantages of New European Union members mean that trade is developing and there is a marked improvement in productivity. However, FDIs flowing to new European Union members from the European Union (15) countries were mainly directed at industries of low and medium levels of technological advancement (Damian, Rojec, p. 4).

7. The Dominant Way of Investing by Japanese Companies in the Countries of Central and Eastern Europe: Through Western European Divisions, the Polish Case

There exists a second path taken by Japanese foreign investments. It involves investments through European divisions. The reason for this is that the progressing process of globalization as well as the free–flow of capital around the world imply the phenomenon of foreign investments as links of transnational range and character. This is why many investors originating from Asian markets, especially Japan, invest in Poland, for example, through their divisions located in the countries of Western Europe. It is this way that USD 661 million was invested in Poland in 2003. Transnational corporations that invest this way are Toyota of Belgium, Sumitomo Electric Wiring System of Great Britain, and Mitsui or Germany[2].

A total of USD 106.4 million flowed into Poland in 2004 by way of foreign direct investments from Japan. They accounted for 1.5% of total FDIs flowing into Poland. It should be stressed that at that time there were few Japanese investors in Poland, only eighteen. By the end of 2004 they invested a total of USD 363.3 million.[3] The largest investors from that group were Bridgestone Corporation (USD 221 million), NGK Insulators (USD 18.3 million), Sanden Corporation (USD 17.8 million), Amatsuji Kogo Seisakusko (USD 15.3 million), Tsubaki Nakashima (USD 15 million), Tokai Rubber Industries Ltd. (USD 12.2 million), and Orix Corporation (USD 10 million) (Zubowicz 1999).

On the other hand, Toyota's investments directed through Belgium alone, amounted to USD 220 million in 2004. This gave it sixth place among the major investors in Poland. Through their divisions in the EU15 countries, Japanese companies invested USD 718.4 million in Poland by the end of 2004. Table 5 shows detailed data on these investments. It may be noted that the divisions through which Japanese FDIs flow are concentrated in Great Britain, Germany, and Belgium.

[2] PAIZ.

[3] "List of Major Foreign Investors in Poland," PAIiIZ, Warsaw, 2005. PAIiIZ only registers investments in excess of one million U.S. dollars.

Table 5. Total Japanese Investment Flowing into Poland through EU Divisions up to the End of 2003 and 2004 (million USD)

No.	Company	Total FDI (million USD)		Division country
		2003	2004	
1.	Toyota	180.0	507.1	Belgium
2.	NSK Europe Limited	81.8	81.8	United Kingdom
3.	Matsushita Electric Europe Ltd.	61.2	63.6	United Kingdom
4.	Bank of Tokyo – Mitsubishi N.V.	30.3	30.3	Netherlands
5.	Nomura International Plc	17.5	—	United Kingdom
6.	Takata Petri AG	—	18.3	Germany
7.	Sumitomo Electric Wring System Europe Ltd.	25.0	8.2	United Kingdom
8.	Kodak Ltd.	4.7	4.7	United Kingdom
9.	Mitsui & Co. Deutschland	1.2	2.7	Germany
10.	FUJI PHOTO (Europe)	1.7	1.7	Germany

PAIiIZ only registers investments in excess of one million U.S. dollars.

Source: Study based on the "List of Major Foreign Investors in Poland," PAIiIZ Polish Information and Foreign Investment Agency S.A., Warsaw, 2005.

8. The Impact of Japanese Direct Investments on Creating and Developing a Knowledge–Based Economy

A specific quality of the new era of civilization is the prime importance of knowledge and information as basic micro– and macro–economic resources. The OECD and the World Bank provide a definition of the *knowledge–based economy* (KBE) in its macro–economic sense, where the economic development is dependent on the production and distribution, as well as the creation, absorption, application, and transfer of knowledge and information.[4] For its part, a knowledge–based economy in its micro–economic sense is one where competitive advantage is derived from knowledge that is held and utilized in the company and requires a knowledge society—people with key skills that are capable of and ready to learn throughout the whole of their lives. Knowledge societies attach special weight to human resources, to knowledge and skills, and to ways of their utilization. Such an economy is characterized by increased access to education as well as investments in scientific research and information

[4] OECD, *The Knowledge–Based Economy*, OECD/GD (96) 102, p. 7.

technologies. However, its overriding aim is the creation of new knowledge, innovation, and their implementation into industry in the form of new technologies and products. New ideas improving efficiency and replacing or supporting human labor are of greatest value.

The moving of material– and energy–intensive production from the countries of Western Europe, North America, and certain regions of Asia and the Pacific (e.g. Japan), which are developing the knowledge–based economy model, to those economies that are developing rapidly, but whose development is either still running along extensive paths or parallel ones, is visible throughout the world (Kulisiewicz 2003).

A common, strategic target was endorsed and entered into the final document of the Lisbon Summit of March of 2000: By the year 2010, the economy of the European Union is to become the most competitive and dynamic knowledge–based economy in the world, capable of sustainable economic growth with more and better jobs (Boruta 2002). For its part, the common direction of OECD economies is the achievement of the status of a knowledge–based economy.

The role of knowledge in economic development is forcibly witness by the success of OECD countries. Over the last four decades of the 20th century, these countries achieved the highest level of social and economic development precisely because in the nineteen–sixties they started investing in an economy whose foundation is formed by knowledge as a resource and as a stream of new knowledge, in other words, in scientific research. As outlay for various types of knowledge and technology grows, the OECD countries move towards a knowledge–based economy. The growing use of information and communication technologies (ICT) lies at the foundation of this shift. An expression of the role of the knowledge–based economy in the countries of the OECD is data depicting the percentage share (current prices) of added value in knowledge–based industries. In the case of Japan, the share amounted to 53% in 1996, 55.3% in the United States, 50% in France, and 58.6% in Germany. The indicator for the whole of the European Union for the year 1994 amounted to 48.8%, while the figure for all the countries of the OECD was 50.9% (Science, Technology and Industy… 2007, pp. 126–127).

Table 6. Japan: Science and Technology

	2001	2002	2003	2004	2005
Gross domestic expenditure on R&D (percentage of GDP)	3.07	3.12	3.15	3.13	—
Researchers (per thousand full time equivalent employees)	10.21	9.9	10.38	10.38	—
Patents (number of triadic patent families)	12683.8848	12927.7697	13564.3513	—	—
Shares of ICT investment in non–residential fixed capital formation (as a percentage of total non–residential fixed capital formation, total economy)	15.8163	14.5323	15.5889	15.8606	—
Export of information and communication equipment (millions of USD)	94517.5605	79851.952	88959.2852	104011.1121	121473.7681

Source: Japan – "Outflows of Foreign Direct Investment" – www.oecd.p4.siteinternet.com (January 14, 2008).

A positive impact in economic growth of the given country is noted as citizens grow increasingly well educated (human capital). Japan is a very good example of this. There, especially in the wake of World War II, stress was placed on educating the population not only by way of universal access to schooling, but also through the development of skills. What occurred was a quick rise in the level of education. The system of training a work force and high level specialists, which is among the most advanced in Japan, emerged on that foundation of basic education. This is the source of the positive assessment of Japanese technical skills, adaptive abilities, and professional solidarity and diligence. Discipline and reliability also seem important. Not without significance is the readiness of society to reform in the educational sphere. It was during this period that there appeared a need for specific use of the state scientific, research, and educational base. State laboratories and research institutes served as the basis of many directional technological processes. The Japanese government made decisions for investment in research work, mainly in the area of primary scientific research, which served as the foundation for a new economy and was the starting point for technological progress in production plants. Research capacity continued to be developed and technology and education received support.

Foreign direct investments within Japan were important in as much as they provided a selective channel for the flow of technology. An active policy of utilizing world achievements in the realms of economy, administration, and technology became a characteristic feature of the modern development of Japan. The objective of such activities was both quantitative and qualitative in its

effects. The government program for research and utilization of foreign technological achievements was actually created at the beginning of the Meidzi period. Among other things, stress was placed on bringing in foreign experts as well as sending Japanese specialists to study abroad, mainly in the United States and Europe. The inflow of technology exclusively through the importing of goods (the most up–to–date machines and equipment) and licenses was sufficient up to only a certain moment in the modern development Japan's industry. In this initial phase, Japan leaned towards and preferred the bringing in of applied studies (directly applicable in practice) as opposed to primary research. However, the later period was marked by highly skilled creative development and processing of procured technology.

It was at this time that positive changes were noted in Japan and economic growth was obvious. This carried with it greater numbers of research efforts, which resulted in greater investments abroad because the role of Japanese foreign direct investments was growing systematically. Moreover, productivity improved in light of existing international competition. Another positive factor—a locomotive for animation—was the opening up of markets as a part of the globalization process. The Japanese government decided to provide additional funds to finance greater investments in research and development work, technology, infrastructure, and education. The guiding principal was that as a result of high rates of return on these investments, the GDP can be greater and the economy can have greater growth potential at its disposal. In continuing this line of reasoning it is possible to conclude that the long–term basis for a country's stability is created through the new economy and innovations, which are behind increased productivity, which in their turn are dependent on advances in science, thus on university researchers.

Research institutions were expanded and new centers were established that were oriented towards the independent improvement of technological solutions procured abroad. This subsequently led to original Japanese success stories in technology. This played a role in the emergence of new and the perfecting of existing inventions and manufacturing technologies, including miniaturization. Research conducted by Japanese scientists resulted in a series of innovations that brought in many patents, which resulted in modern products.

The next phase was the export of Japan's own licenses abroad to developing countries, including through foreign direct investment. Eastern Asian economies that absorbed Japanese investments over the years 1960–1990 are an example here (Tran Van Tho, pp. 243–271).

Japan selected the right road by stimulating, supporting, and sustaining the specified fields. Investment in the most up–to–date technologies started bringing in returns in the form of productivity growth stemming from

investment in these new technologies. Thus, modern technologies started to meet the hopes that had been placed in them. Investment in research made in the country for years seemed to ultimately provide a return. Technical and technological innovation coupled with the globalization process caused Japanese corporations to start investing in the most attractive regions – Asia, Europe, and the Americas. On a world scale, such Japanese corporations as Toyota, Honda, Sony, Nissan, Mitsubishi, Matsushita, Mitsui, and Hitachi occupied leading positions. They all operated on the world investment capital market in fields important for the future such as the automobile, electrical, and electronic industries. The only exception was Mitsui, which was involved in wholesale trading (Dobroczyński 2004, pp. 174–185).

The corporations had their own interests in mind in financing scientific research. At this stage Japanese technology was no worse than Western technology in many fields. What was noted was a clear creative input into world technology – the generation of intellectual added value of international ranking. Mixed state–private technological research centers were established and joint efforts by corporations and other companies occurred, where the main technological specialization was product miniaturization. The dynamics of international turnover in modern "science–intensive" and technically complex products significantly exceeds the overall dynamics of world trade and reaps exceptionally large economic benefits (Dobroczyński 2004, pp. 186–196).

The application of modern technologies by Japanese corporations results in the manufacture of the best products in the world in terms of quality. Looking at the automobile industry, eight out of ten least defect prone cars are Japanese vehicles from brands such as Toyota, Mazda, and Subaru (Dobroczyński 2004, pp. 206–222). Japanese automobile manufacturing corporations compete with Western corporations on international markets. In addition to Toyota, these include Nissan, Honda, Suzuki, Mitsubishi, Mazda, Fuji–Subaru, and Isuzu. It may be stated that this is a result of the increasingly high level of Japanese technological achievements. Thus, a claim may be made that Japanese foreign direct investments play a role in the creation and development of a knowledge–based economy, where the obvious effect of the dissemination of a knowledge–based economy is globalization, a process that is the result of the impact of new technologies.

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