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THE JAPANESE ECONOMIC ENIGMA

ABSTRACT

The subject of this article is the Japanese enigma: the long-lasting extraordinarily rapid economic growth, the so-called Japanese economic miracle, and then a very sharp set-back in the growth rate, the prolonged recession. The authors, using an endogenous growth model, have proven that an economic miracle did not happen in Japan either: the very rapid growth proceeded in conformity with the general regularities of economic development. The main cause of prolonged recession, according to the empirical results, is the currency shock, occurred on the basis of an international agreement in the mid-1980s, which decelerated the hitherto extremely dynamic development of Japanese exports, considerably retarding the main factor of rapid economic growth.

The Japanese economy after World War II had long been the most dynamically developing part of the world economy, one of its determinant factors. In this connection, the *expression* “*Japanese economic miracle*” entered the vocabulary of mass media, which, however, in the 1990s was made obsolete by an unexpected turn, the *prolonged recession*. The country’s difficulties have perceptibly intensified tensions in

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the *globalising world economy*. The various anti-crisis measures have not yet brought about a permanent and considerable improvement of the situation.

Special literature has dealt with the problems of Japanese economy in many respects. *Johnson* regards Japan, contrary to free market and centrally planned economies, as a *developmental state based on an alliance of government and industrialists*. This state does not hold the functioning of private sector as inconsistent with its own objectives. It has never striven for direct management of private firms. On the other hand, it did its best to promote undertakings, to achieve the aims of the ruling elite, which simultaneously implied economic growth. The symbiosis of market mechanism and public regulation in Japan is, after *Hamada*,² also called *managed market economy*. *Katz*³ investigated not only the emergence but also the *fading* of the Japanese economic miracle. *Hamada* and *Honda*⁴ analysed the growth of productivity in Japan after World War II. *Nadiri* and *Kim*⁵ compared the manufacturing performance of Japan to that of the United States and South Korea. *Frenkel*, *Pierdzioch* and *Stadtman*⁶ found a positive correlation between the foreign exchange market interventions of the Bank of Japan (BOJ) and exchange rate fluctuations, namely that, in the investigated period (1993-2000), the policy of BOJ increased the exchange rate volatility of yen against the dollar.

In this article, we are looking for an answer to the following *problems*: (1) why was economic growth in Japan extraordinarily rapid for a long time; in other words, how can the “Japanese economic miracle” be

2 Koichi Hamada, “The Incentive Structure of a ‘Managed Market Economy’: Can It Survive the Millennium?”, *AEA Papers and Proceedings*, Vol. 88, No. 2 (1998), pp. 417-421.

3 Richard Katz, *Japan, the System that Soured: The Rise and Fall of the Japanese Economic Miracle*, M.E. Sharpe, Armonk, New York, 1998.

4 Koichi Hamada and Tetsushi Honda, “Engine of the Rising Sun: Productivity Growth in Postwar Japan”, In: Mario Baldassari, Luigi Paganetto and Edmund S. Phelps (eds.), *Market Globalization and Economic Areas*, SIPI, Rome, 1994, pp. 397-438.

5 M. Ishaq Nadiri and Seongjun Kim, “R&D, Production Structure and Productivity Growth: A Comparison of the US, Japanese and Korean Manufacturing Sectors”, *NBER Working Paper Series*, No. 5506, Cambridge, Massachusetts, 1996.

6 Michael Frenkel, Christian Pierdzioch and Georg Stadtman, “The Effects of Japanese Foreign Exchange Market Interventions on the Yen/U.S. Dollar Exchange Rate Volatility”, *Kiel Working Papers*, No. 1165, Kiel Institute for World Economics, 2003.

explained; (2) why did it decelerate afterwards to an extremely great extent; i.e., how did the prolonged recession originate; and (3) what was the role of economic policy in all that? In connection with these problems, we shall first briefly characterise the main phases of Japan's economic development and economic policy since the early 1950s and then, relying on an investigation with models of mathematical economics, try to solve the *Japanese enigma*.

GENERAL CHARACTERISTICS

In the last more than half a century, namely beginning in 1950, three main phases of Japan's economic development can be distinguished. The first phase endured essentially until 1973, the first oil price explosion. This was the typical period of "Japanese economic miracle" when the country, converting its earlier created defence industry into export sectors, became one of the largest steel, ship and rolling stock suppliers in the world.⁷ At the same time, the government vigorously supported the weak and young industries (automobile industry, electronics, etc.) promoting their world market competitiveness. The corporate and financial sectors and the state were being mutually linked by strong ties. In economic management, the greatest influence, along with the Ministry of Finance (MOF), was exerted by the Ministry of International Trade and Industry (MITI), which played an outstanding role in the development of the country's strongest firms, in financing their innovative investments. Planning, started in the mid-1950s, was of indicative character that, in essence, did not change the determinant importance of market mechanism in the functioning of Japanese economy.

*In the second phase, from 1973 to the early 1990s, economic growth in Japan was decelerating, but remained relatively rapid. The deceleration occurred mostly, though not exclusively, under the impact of the two oil price explosions. The high energy prices demanded an active development of research-intensive, so-called knowledge-based industries and, in this connection, the intensification of two-way consultations between the state and the private sector. The state stimulated the reduction of declining activities and comprehensively supported the small- and medium-sized enterprises. Besides, however, the Japanese insisted on the earlier formed cross-shareholding of large firms (the *keiretsu*, groups of allied companies, usually linked through a bank), on the convoy policy, saving banks from*

⁷ See: Kozma Ferenc, *Külgazdasági stratégia*, Aula Kiadó, Budapest, 1996.

failure, as well as on the treatment of lifetime employment as a fundamental value.

Due to a rapid structural change, the Japanese industry was supplying competitive commodities of good quality to the world market, and the country accumulated a significant *current-account surplus*. *Because of its increasing trade surplus, Japan was put under strong international pressure to switch over to a growth path led by domestic demand. Under the so-called Plaza Agreement, concluded by finance ministers of the world's five leading powers (US, Japan, FRG, UK and France) in September 1985, the Japanese yen was very significantly revaluated against the US dollar (currency shock). The macroeconomic consequences of this step will be discussed later.*

In the early 1980s, international capital transactions were liberalised. The started deregulation of financial sector enabled Japan's large corporations to finance their projects directly from the stock market. The banks could freely resell the newly issued government bonds; moreover, they could buy foreign securities as well. Japan's banks came to dominate international financial relations, the Tokyo Stock Exchange emerged as one of the largest securities markets in the world, and the country became the world's largest capital exporter. At the same time, the inflow of speculative capital contributed to the emergence of the so-called "bubble economy",⁸ an unjustified rise in real estate and share prices. For some length of time, the expansionary monetary policy was effective in the same direction. Finally, however, the central bank made a restrictive series of steps, and in 1991, under the impact of a significant interest rate rise, the stock market bubble burst out. This event ushered in the third phase of Japan's economic development (following 1990), which is, apart from episodes of temporary recovery, characterised by a prolonged recession, a long-lasting very significant deceleration of the rate of economic growth. In the past decade and a half, there were numerous attempts to overcome the crisis, which, however, have not yet brought about a permanent result.⁹ What attempts are in question?

8 A bubble economy is generally characterised by an extraordinary and permanent rise in stock (e.g., real estate, securities) prices. In an economic sense, it means a rise or fall in stock price departed from reality.

9 In essence, it happened because *the root cause of the crisis was not eliminated*, as will be seen below.

It is obvious that a stagnant economy and the acceleration of globalisation necessitate the *revision of the regulation system, the elimination of still existing obstacles to market competition*. In this connection, the MOF has, since 1992, been annually submitting revitalising *packages*. In the field of structural reform and deregulation, the first determinate steps were taken in 1993. To accelerate economic growth, the *discount rate* of the BOJ was reduced to 0.5 percent in 1995 and then to *zero* in 1999. In 1996 and in later years, *comprehensive reforms* were initiated, comprising the structure of the economy, the financial system, public administration, budget and social insurance, as well as education. *Pension reform* was first tried in 1994, but a reform conception ensuring adequate financing was adopted only in 1999. Meanwhile, the industry-protecting and aid policies of the Tokyo government began to soften. A sign of this was the Uruguay GATT agreement initialled in 1993. In the 1990s, the disintegration of enterprise structure based on cross-shareholding (the keiretsu) also began. Several firms, banks and credit cooperatives failed. Japan's capital market, including transactions in foreign exchange, was liberalised to such an extent that economic policy alone was not able to affect financial indicators any more; the MOF had lost its power necessary for reorganising the financial sector.

Reforms in the public sector were aimed to strengthen market factors and increase efficiency by *limiting the economic role of government*. *Privatisation* begun earlier went on, but it was not consistent and served first of all to increase budget revenue. Other *problems of economic policy* had also arisen. The inconsistent monetary policy did not curb but reinforced the cyclical fluctuations. Banks were not incited to carry out restructuring; they could not adequately handle the non-performing loans. In this situation, *the ratio of gross public debt to GDP rose from 68.6 percent in 1990 to 157.5 percent in 2003*, which is an extraordinary indebtedness on a world scale.¹⁰

The *Asian crisis, which broke out in 1997*, reached its nadir in Japan in 1998, further deteriorating the situation in the country. The government enacted measures aimed at macroeconomic stimulation (see above) and the reorganisation of the banking system, under the impact of which in 1999 a modest economic recovery began. Between August 1999

10 *OECD Economic Outlook*, Vol. 2, No. 76 – December, Paris, 2004, p. 198. The extraordinary indebtedness of Japanese *state* also has deeper causes than those outlined above (see below).

and April 2000, Japan's largest commercial banks merged into financial groups. The Mizuho Financial Group became through the merger of Industrial Bank of Japan, Dai-ichi Kangyo and Fuji Bank the largest bank in the world. The government of *Junichiro Koizumi*, which took office in April 2001, in order to overcome the budget deficit, initiated long-term fiscal restrictions and structural reforms, urging on the consolidation of the banking system. The *Takenaka Plan*, announced in November 2002, was aimed to increase the severity of categorising the outstanding debt of banks and ensure provisions for liabilities and charges. The plan, however, was adopted in a strongly diluted form, after its leakage before official announcement caused a bank-share selling wave in the Tokyo Stock Exchange. The estimated limit of budget expenditure was not held either.¹¹

*To characterise the successfulness of economic policy, using the basic macro indicators, various indices can be constructed.*¹² Their structure is such that *negative or zero values are favourable, whereas the positive ones are unfavourable.* As seen from Table 1, in Japan between 1951 and 2003 these indices *for the most part tendentially worsened*, except for such components as inflation and current-account balance. The *total index*, in the first phase of economic development, was very favourable, mainly in connection with the rapid economic growth; in the next two phases, however, it became unfavourable. In the 1990s, neither the curbing of inflation nor the interest rate reduced to a level close to zero stimulated adequately the real sphere. Monetary policy became inadequate to influence aggregate demand. *The Japanese economy fell into a liquidity trap.*¹³

11 See Évelyne Dourille-Feer (dir.), *Japon. Le renouveau?*, La Documentation Française, Paris, 2002; Koichi Hamada, "Bubbles, Bursts and Bailouts: A Comparison of Three Episodes of Financial Crises in Japan", In: Mitsuki Okabe (ed.), *The Structure of the Japanese Economy: Changes on the Domestic and International Fronts*, St. Martin's Press, New York, 1995, pp. 263-286; Koichi Hamada, "The Incentive Structure of a 'Managed Market Economy': Can It Survive the Millennium?", op. cit.; Kotaro Suzumara, "Japan's Industrial Policy and Accession to the GATT: A Teacher by Positive or Negative Examples", *Hitotsubashi Journal of Economics*, Vol. 38, No. 2, December 1997, pp. 101-123.

12 Veress József (szerk.), *Bevezetés a gazdaságpolitikába*, Aula Kiadó, Budapest, 1997, 239-240. old.

13 Paul Krugman, "It's Back: Japan's Slump and the Return of the Liquidity Trap", *Brookings Papers on Economic Activity*, Vol. 2 (1999), pp. 137-205.

Table 1: Calculated macro indices in Japan between 1951 and 2003
(average of annual values)

Indicator	1951-1973	1974-1990	1991-2003	1951-2003
a. Inflation (CPI, %)	5.9	4.9	0.6	4.1
b. Rate of unemployment (%)	1.2	2.3	3.8	2.2
c. <i>Misery index</i> (a+b)	7.1	7.2	4.4	6.3
d. Average annual growth rate of GDP (%)*	9.3	3.8	1.3	5.5
e. <i>Index of unpopularity</i> (a-3d)	-22.0	-6.5	-3.3	-12.4
f. Central government balance in percentage of GDP	0.2	-5.0	-4.3	-2.6
g. Current account balance in percentage of GDP	0.4	1.4	2.5	1.2
h. <i>Index of disequilibrium</i> -(f+2g)	-1.0	2.2	-0.7	0.2
Total (c+e+h)	-15.9	2.9	0.4	-5.9

* Calculated at 1995 prices.

Sources: Japan Statistical Yearbook, Statistics Bureau, Tokyo; Yearbook of Labour Statistics, ILO, Geneva; International Financial Statistics Yearbook, IMF, Washington, D.C.; World Economic Outlook, IMF, Washington, D.C., various volumes.

In 2004, the growth rate of GDP in Japan amounted to 2.7 percent, but in the first quarter of 2005, it fell to a low level again.¹⁴ In the period from 2005 to 2030, the Japanese government is to reckon with a 1.5-2.0 percent average annual growth. It treats as a principal task the continuation of pension reform and the privatisation of postal services. Public-utility services will increasingly be performed not by state institutions but by private entrepreneurs and non-profit organisations. The planned measures are primarily intended to improve productivity and competitiveness by heightening the mobility of workforce.¹⁵

The Japanese economy, contrary to the state, not only avoided indebtedness, but already in the mid-1980s became the world's leading net creditor. The amount of money necessary for financing investment was ensured, on the one hand, by household savings and, on the other, by the high share of centralised revenue, as well as a trade surplus. At the same time, the investments of the 1990s did not result in a considerable

14 See the website of Economic and Social Research Institute, Tokyo, Internet, 15/07/05, <http://www.esri.cao.go.jp>

15 See Hernádi András, "Japán jövőképe a 21. századra", MTA VKI, Budapest. *Vélemények, kommentárok, információk* c. sorozat. 103. sz., 2005. június 3.

economic growth any more, but essentially served to impede a further deceleration of growth rate.¹⁶

How did the *sectoral structure* of Japanese economy change in the investigated more than half a century period? On the basis of data in Table 2, it can be stated that *it was primarily agriculture and services where very significant structural changes occurred*. The former's share decreased to below one-tenth from 1950 to 2003, while the latter's increased to its manifold value, at least regarding employment, and in 2003 it already amounted to almost three quarters of the national economy. The weight of industry and therein manufacturing changed much less and, in addition, not always in the same direction. *The share of employed in industry until 1973; i.e., the first oil price explosion, increased markedly, to almost one and a half times its original value; since then, however, it had tendentially been decreasing and in 2003 did not much exceed the level of 1950.*

Table 2: Japan's GDP and employment by economic activity
(in percentage, national economy = 100)

Year	GDP (at current prices)				Employment			
	Agriculture <i>A-B</i>	Industry <i>C-E</i>	Manufacturing <i>D</i>	Services <i>F-Q</i>	Agriculture <i>A-B</i>	Industry <i>C-E</i>	Manufacturing <i>D</i>	Services <i>F-Q</i>
1950	22.7	32.2	27.4	45.1	47.5	19.2	17.6	33.3
1960	13.3	38.2	34.2	48.5	32.5	22.9	21.3	44.6
1973	5.9	37.6	35.2	56.5	13.4	28.3	27.4	58.3
1980	3.7	32.5	29.2	63.8	10.4	25.4	24.7	64.2
1985	3.2	33.1	29.5	63.7	8.8	25.7	25.0	65.5
1990	2.5	29.3	26.5	68.2	7.2	24.7	24.1	68.1
1995	1.9	25.9	23.1	72.2	5.7	23.3	22.5	71.0
2000	1.4	24.8	21.9	73.8	5.1	21.1	20.5	73.8
2003	1.3	23.7	20.8	75.0	4.6	19.7	19.1	75.7

Sources: National Accounts Statistics, UN, New York; National Accounts, OECD, Paris; Yearbook of Labour Statistics, various volumes; Economic and Social Research Institute, Tokyo, Internet, 15/07/05, <http://www.esri.cao.go.jp>

Within industry, manufacturing dominated from beginning to end and moreover to an increasing extent. Current price data show that the price level of industry, in the entire investigated period, was relatively high but to a diminishing degree. The latter is primarily a consequence of an increase in productivity of industry and manufacturing which was much more rapid than the average.

16 See: Évelyne Dourille-Feer (dir.), *Japon. Le renouveau?*, op. cit.; Ferber Katalin, *A siker ára – Japán*, László és Társa, Budapest, 1998; Richard Katz, *Japan, the System that Soured: The Rise and Fall of the Japanese Economic Miracle*, op. cit.

Table 3: Share of dynamic branches in manufacturing value added, employment and investment in Japan
(percentage)

Year	Value added*		Employment		Gross fixed capital formation*	
	Chemical industry 24-25	Engineering industry 28-35	Chemical industry 24-25	Engineering industry 28-35	Chemical industry 24-25	Engineering industry 28-35
1960	13.4	33.6	7.2	30.3	17.0	27.6
1973	12.9	39.8	8.3	41.8	12.7	35.6
1980	12.7	41.0	8.5	42.4	15.2	41.1
1985	13.4	47.3	8.7	46.7	13.8	50.8
1990	14.2	48.4	9.0	47.1	15.1	50.9
1995	15.0	46.8	9.4	47.2	15.1	46.3
2000	15.4	48.2	10.0	48.6	15.3	55.6

* At current prices.

Sources: Industrial Statistics Yearbook, UN, New York; International Yearbook of Industrial Statistics, UNIDO, Vienna; Structural Statistics for Industry and Services, OECD, Paris, various volumes.

The successes of the Japanese economy were first of all due to the dynamic branches embodying modern technology: the engineering and chemical industries. From 1960 to 2000, their joint share in manufacturing value added rose from 47.0 to 63.6 percent, in employment from 37.5 to 58.6 percent and in investment from 44.6 to 70.9 percent, respectively. The increase in the weight of dynamic branches continued after the two oil price explosions and even in the period of prolonged recession (Table 3). In the catch-up with the world level, it was primarily the development of engineering industry that had a crucial role.

From the viewpoint of *economic competitiveness*, wage formation is of the greatest importance. From 1951 to 2003, real wages, namely the hourly wages corrected by the consumer price index (CPI), in Japan's manufacturing increased on average by 3.0 percent per annum (Table 4). At the same time, labour productivity in the national economy and manufacturing rose by 4.2 and 6.1 percent, respectively; i.e., more rapidly than wages (calculated from the Appendix). Japan's hourly wages between 1950 and 1990 came nearer to the level of the United States, but in the 1990s, however, a process of opposite direction took place. Japan in the entire investigated period, but particularly until the early 1970s, was in a significant competitive advantage over the US. With the rise of newly industrialising East and Southeast Asian countries as well as China, the

Table 4: Hourly wages in Japan's manufacturing
(in dollars of 1995, at purchasing power parity)

Year	Dollars*	Index: 1995 = 100	Average annual change (percentage)	Relative wage level in percentage of the United States
1950	1.85	21.8	–	19.9
1955	2.45	28.9	5.8	23.2
1960	2.94	34.6	3.7	25.7
1965	3.78	44.5	5.2	30.6
1970	5.88	69.3	9.3	45.6
1975	8.73	102.8	8.2	64.9
1980	8.95	105.4	0.5	67.7
1985	9.51	112.0	1.2	71.5
1990	10.62	125.1	2.2	84.6
1995	8.49	100.0	-4.4	68.8
2000	8.74	102.9	0.6	69.0
2001	9.03	106.4	3.4	71.1
2002	9.03	106.4	0.0	69.7
2003	8.97	105.7	-0.7	68.8

* US Dollar 1 = Yen 200.

Sources: Yearbook of Labour Statistics, various volumes; New Cronos Eurostat database.

Japanese advantage was essentially lost, since in those countries wages are lower than in Japan.

Japan's economy, owing to its open character, depends on price fluctuations of basic raw materials, primarily of crude oil, in the world market. For the country, the *terms of trade* until the first oil price explosion developed unusually favourably, exceeding on average by 30 percent the level of 1950 (calculated from the Appendix). Particularly good was the situation in the second half of the 1960s and in the early 1970s (a surplus of about 40 percent). Under the impact of the oil price explosions, in the 1973-1990 phase of development, a nearly 8 percent negative deviation from the level of 1950 occurred, which after 1990 increased to above 10 percent. From all that, it can be concluded that *one, though not the most important cause of the prolonged recession, which unfolded in Japan in the 1990s and essentially continues up to the present, is the fluctuation of oil prices and terms of trade.*

What is the role of capital imports and exports in Japan's economic development? A picture of this is presented in Table 5. In 1985, Japan started large-scale direct investments as well as financial operations and real estate purchasing in the United States and, in parallel with this, placed out functioning and moneylender's capital in Western Europe. The

Table 5: Japan's inward and outward FDI stocks

Year	Inward FDI stock			Outward FDI stock		
	USD million	In percentage of:		USD million	In percentage of:	
		GDP	World		GDP	World
1980	3 270	0.3	0.5	19 610	1,8	3.5
1985	4 740	0.3	0.5	43 970	3,2	6.0
1990	9 850	0.3	0.5	201 441	6,6	11.5
1995	36 658	0.7	1.2	238 452	4,5	8.2
2000	50 322	1.1	0.8	278 442	5,9	4.7
2001	56 563	1.2	0.8	316 775	7,2	4.7
2002	78 140	2.0	1.1	304 237	7,7	4.2
2003	89 729	2.1	1.1	335 500	7,8	4.1

Source: World Investment Report, UNCTAD, New York and Geneva, various volumes.

outsourcing of manufacturing capacities into Southeast Asia intensified, first of all in the field of electronics and automobile industry, and there was also a sudden increase in the country's foreign assets. Foreign direct investment (FDI) outflows from Japan aim not only at gaining markets but also form part of the retrenchment strategy of Japanese firms. Outsourcing of parts production and research and development (R&D) has been playing an increasing role. The distribution of *direct investment abroad* from Japan by sector between 1989 and 2000 had scarcely changed. The share of agriculture amounted to a mere 0.3 percent, that of mining and manufacturing decreased from 1.9 to 1.3 percent and from 24.1 to 24.0 percent, respectively; while that of services increased from 73.7 to 74.4 percent. Substantially more significant changes occurred with regard to the *direction of Japan's capital exports*. The share of the United States contracted from 48.2 to 25.0 percent, while that of the European Union expanded from 26.2 to 49.2 percent. The share of China and Taiwan rose from 0.6 to 2.0 percent and from 0.7 to 1.0 percent, respectively; whereas that of Hong Kong fell from 2.8 to 1.9 percent. The relative weight of Southeast Asian countries (Indonesia, Malaysia, Singapore, Thailand and the Philippines) reduced from 6.9 to 5.1 percent.¹⁷

In the early 1980s, *relatively more considerable direct investment from abroad* began to flow in Japan, too; but it was much less than capital exports. In 2003, the exported capital stock was 3.7 times greater than the imported one; the net balance amounted to 5.7 percent of GDP; i.e., *Japan remained a net capital exporter* (Table 5). The relatively small volume of

¹⁷ International Direct Investment Statistics Yearbook 2001, OECD, Paris, 2002, pp. 231, 234, 235.

foreign capital invested in Japan's economy can chiefly be explained by the high company income tax and rents, the tradition of lifetime employment, as well as public regulation favourable for domestic small- and medium-sized enterprises. Foreign investors could rather difficultly gain shares in Japanese firms. By the late 1990s, deregulation had largely opened up industry and services to foreign transnational corporations. In the course of the decade, the number of mergers and acquisitions initiated by foreigners was steadily growing, and not only American but also Far Eastern firms took part in them. Between 1989 and 2000, in the *direct investment from abroad* flowed in Japan, the share of manufacturing decreased from 41.0 to 25.3 percent, while that of services increased from 59.0 to 74.7 percent. In the same period, the share of the US and EU diminished from 57.4 to 32.3 percent and from 17.4 to 15.1 percent, respectively.¹⁸

To our mind, capital imports and exports did not significantly affect Japan's economic development, the capital imports first of all because of its little weight, many magnitudes below that of, e.g., Ireland.¹⁹ Though net capital exports *directly* reduced the volume of assets available for domestic accumulation, this effect was presumably for the most part *compensated* by the thus achieved market expansion, cost reduction and profit repatriation, as well as the positive growth effect of interest received for credits given to foreigners. Therefore, *net capital exports should also be excluded from the root causes of prolonged recession. But if such is the situation, then what has happened in fact?*

According to Katz,²⁰ Japan's economic system was capable of promoting the country's catch-up with the West, but after this happened, it became an obstacle to further development. During the industrialisation of the 1950s and 1960s, the strategy of developmental state, in his opinion, could be successfully implemented because then the country's economy was still in the phase of catch-up. Under the impact of international competition, the Japanese exporters (e.g., in the field of car manufacturing or mechanical engineering) had, by the early 1970s, reached an outstandingly high technological and productivity level on a world scale,

18 Ibid., pp. 230, 232, 233.

19 See: György Simon Jr., "Ireland's 'Economic Miracle' and Globalisation", *Međunarodni problemi*, Vol. LVII, No. 1-2/2005, pp. 5-30.

20 Richard Katz, *Japan, the System that Soured: The Rise and Fall of the Japanese Economic Miracle*, op. cit.

too. At the same time, the protected manufacturing branches producing exclusively for the domestic market (food industry, textile industry, etc.) became backward from the viewpoint of international standards.²¹ From the 1970s onwards, Japan's economic policy, which continued to insist on the conception of developmental state, did not help the turning of infant industries into competitive exporters; instead, it protected the inefficient but politically connected sectors against domestic and international competition – the support of the winners was gradually replaced by the protection of the losers. Thus, *Japan became a distorted dual economy*, which is essentially a dysfunctional hybrid of very strong export branches and extremely weak sectors oriented towards the domestic market. This dual economy could operate smoothly so long as the efficient exporters received revenue enough to support the weak domestic sectors. By the late 1980s, the Japanese exporters were being able to increasingly harder bear this burden; since, because of the rising domestic costs and exchange rate of the yen, they found themselves in a bad plight. Therefore, more and more of them outsourced abroad, where they invested in off-shore markets. Efficient export branches were gradually leaving Japan. As a consequence, the productivity of the whole economy sank to the level of stagnant sectors.

Is Professor Katz's argumentation valid? Our investigation, as will be seen below, put this range of problems into another light. To solve the Japanese economic enigma, we should examine more closely the growth factors.

THE JAPANESE ENIGMA AND EXCHANGE RATE POLICY

Factors of economic growth can be divided into two large groups: demand and supply factors. *Demand factors* include *investment*, *exports* and *consumption*. *Supply factors* are the *production factors*, the latter's role in Japan will be discussed later. The two groups of factors do not separate sharply from each other: the demand factors (e.g., investment) are *indirectly*, for the most part, production factors, too. From the viewpoint of analysis, however, a separate investigation is expedient.

In Japan's economic growth, a key role is played by *exports*. But *what determines export trends?* Along with the terms of trade, *the exchange rate is presumably the factor on which exports greatly depend*. To quantify

21 On the basis of data in Table 3, it is perceptible that the weight of these branches in manufacturing considerably decreased, therefore their impact on Japan's economic development could hardly be decisive.

this relation, we set out from the fact that *currency, similarly to wages, also has, in addition to an actual market rate,²² a real exchange rate.* Let us denote the actual, i.e., nominal exchange rate with V_N , the real rate with V_R and the ratio of the two indicators with V , where $V = V_N / V_R$. The nominal exchange rate is kept on file by statistics; the *real one should be calculated.* In this paper, we consider *purchasing power parity (PPP) as the real exchange rate, namely for the gross domestic product (GDP)* (see the Appendix where the calculation results can also be found).

Table 6: Dynamics of demand factors, GDP, terms of trade and exchange rate in Japan

Denomination	1951-2003	1951-1990	1991-2003	1951-1985	1986-2003
Investment	7.0	9.4	0.0	9.6	2.2
Exports	9.7	11.6	4.3	12.6	3.9
Consumption	5.1	6.2	1.8	6.5	2.5
GDP	5.5	7.0	1.3	7.3	2.3
Terms of trade*	8.1	14.1	-10.3	16.7	-8.9
Exchange rate (V)**	1.30	1.50	0.695	1.61	0.704

* Average of annual changes in percentage, the base year is 1950.

** Average of annual indicators.

Source: calculated from the Appendix.

What was the role of demand factors in Japan's economic development? Special literature generally considers *investment- and export-led economic development* as most efficient.²³ Data in Table 6 show the change rate of the volume of individual demand factors and GDP in Japan, as well as changes in terms of trade and in the relation (V) between the actual (nominal) and PPP (real) exchange rate. In the table, a bold-type figure denotes the most rapidly growing demand factor in the given period and an italicised one the “runner-up”. *Considering the entire investigated more than half a century (1951-2003), the Japanese economy was first of all export-led and, in a large measure, investment-led as well. Keynes' absolute income hypothesis also fulfilled, according to which consumption grows slower than income, in our case GDP. A very significant, 5.5 percent*

22 We use the yen/dollar exchange rate, having in Japan a role similar to the forint/euro exchange rate in today's Hungary. An increase in this indicator means currency devaluation, whereas a decrease is currency revaluation for a given country.

23 See: e.g. Erdős Tibor, “Mekkora lehet Magyarországon a fenntartható gazdasági növekedés üteme?”, *Közgazdasági Szemle*, 51. évf. (2004), 5. sz., 389-414. old., 6. sz., 530-559. old.

economic growth was achieved, but with a *very uneven distribution in time*. In the period of “*economic miracle*” (1951-1990) the average growth rate reached 7 percent, but after 1990 it fell back to less than one-fifth of the preceding level. The decline took place in such a situation when the investment-led character of the economy entirely ceased and the growth rate of exports slowed to a fracture of its earlier value. The growth of consumption also greatly decelerated, but it anyway became more rapid than that of income.

Table 6 shows the shaping of the situation in another temporal breakdown (1951-1985, 1986-2003), too, which is expedient because in 1985 Japan’s exchange rate policy took a turn on the basis of an international agreement, as already noted above: the yen was sharply *revaluated* against the dollar. It is mainly the effect of this event that is demonstrated in the last two columns of the table. *Japan’s economy before the currency revaluation was very strongly export-led, thereafter the role of exports sharply diminished and consumption took the second place instead of investment. The rate of economic growth decreased to one-third of its earlier value.* It would be a mistake to attribute the dramatic slowdown in Japan’s economic growth exclusively to an exchange rate alteration. The growth regularity caused by the interaction of *demand factors* also had a serious role, as will be seen below. However, let us first examine *what main relations determined investment and exports in Japan.*

Investment can be explained, among others, by profit, interest or liquidity. For Japan, we made an investigation with a modified variety of *accelerator model*, including an explanatory variable representing the replacement requirement.²⁴ In a formula: $I_t = i_1 \Delta Y_{t-1} + i_2 K_{t-1}$. In the model, t is the time index (year), I_t is investment (gross fixed capital formation) in year t , ΔY_{t-1} is the increment of GDP, K_{t-1} is fixed capital in the year *preceding* the reference year, i_1 and i_2 are the parameters of the model. Variables were determined in dollars of 1995; K is the *gross* value of fixed capital (see the Appendix). *The estimation was made by the least squares method.* According to the empirical results, the correlation is close ($R^2 = 0.967$). However, the results obtained for the parameters ($i_1 = 1.51$, $i_2 = 0.0818$) are distorted, which in our case points to the fact that the model undervalue the capital-expansion and overvalue the replacement component of investment.

24 See: Brian Haines, *Introduction to Quantitative Economics*, George Allen and Unwin Ltd., London, 1978.

The *export model* was shaped to get an answer to the following questions: (1) in what rate does the volume of exports change if the actual exchange rate is *equivalent* to the real one²⁵ and terms of trade do not change (as compared to the level of 1950) (2) how does this result modify if the actual rate *differs* from the real one or the terms of trade are changing; and (3) with what accuracy can the dynamics of exports be estimated considering the factors mentioned above? In the model, E_t is the volume of exports in the reference year, E_{t0} is the same indicator in the base year (in 1950), e_1 , e_2 and e_3 are the parameters of the model, $\Delta t = t - t_0$, the definition of V_t has already been given above, $P_t = P_E / P_I$ is the index of export and import prices, respectively, in yen (on 1950 base), \ln is the sign of natural logarithm.

$$\ln (E_t / E_{t0}) = e_1 \Delta t + \sum_{t1}^t (e_2 \ln V_t + e_3 \ln P_t) \quad (1)$$

Economically, relation (1) implies that the growth rate of exports equals the *equilibrium growth rate* (in a logarithmic form e_1) as well as the modifications brought about by the *deviations* of actual exchange rate from the real one and by the *changes* in terms of trade. Table 7 contains the *main results of regression analysis*. The initial data and their sources see in the Appendix; the estimation was made by the least squares method.

Table 7: Empirical results obtained with the export model in Japan
(53 observations)

Period	e_1		e_2		e_3		R^2
	parameter	t statistic	parameter	t statistic	parameter	t statistic	
1951-2003	0.0785	7.05	0.0596	5.52	0.0926	4.09	0.997

Source: see the Appendix.

What main *conclusions* can be drawn from the investigation?

1. *The accuracy of estimation is very favourable: R^2 is more than 99 percent and the relative standard error is less than 3 percent.*
2. *The parameters are significant, as seen from t statistics; their sign and magnitude meet theoretical expectations.*
3. *The equilibrium growth rate of exports in Japan is around 8 percent per annum (on the basis of e_1) if the terms of trade are at the base level of 1950.*

25 This growth rate can, in a certain sense, be considered as equilibrium, since it takes place under an equivalent (purchasing power parity) exchange between countries. We shall henceforth call it *equilibrium growth rate*.

4. *Deviations from the equilibrium rate can be explained by the trends in terms of trade and even more by the fact that until 1985 the actual (yen/dollar) exchange rate had been generally much lower than the real one, but thereafter it was mostly much higher; i.e., the Japanese currency in the period of rapid economic growth was considerably undervalued, whereas in the period of slow growth it was very strongly overvalued.*
5. *Exchange rate policy and the changes in terms of trade, by stimulating or restraining exports and influencing profitability, greatly determined Japan's economic development, as will be discussed in detail below.*
6. Under unrealistically unfavourable exchange rates as well as worsening terms of trade, in an economy strongly dependent on foreign trade, such as Japan, everyone is more or less a loser (except perhaps the importers), and the state, to save what it could, was compelled to settle down for the *protection of losers*. Therefore, the latter is *not* the *cause* of the set-back, as supposed by Professor Katz, but its *consequence*.²⁶

In connection with the outlined above, we shall, in a little more detail, touch upon the question how the exchange rates and terms of trade affect the dynamics of exports and GDP and *why exports have an extraordinarily great role in economic growth in the case of Japan* despite the fact that exports in relation to GDP, calculated at current prices, were not too high – 14.5 percent in 1985 and 11.8 percent in 2003. It is so essentially because since the 1970s Japanese exports have, in more than 90 percent, originated from the pulling sector of the economy; i.e., manufacturing, and its weight as compared to the latter's value added is even more than 50 percent (see the data sources in the Appendix). Therefore, if the growth of exports decelerates, the development of the modern economy's pulling sector and consequently the whole economic growth will slow down.

Why does *currency revaluation* decelerate economic growth? It does so first of all because the given country's products are becoming more

26 Essentially with this is connected, in our opinion, the extraordinary indebtedness of Japanese state, characterised above. Before 1986, a similar role, though only temporarily and relatively more slightly, was played by the two oil price explosions, the terms-of-trade trends unfavourable for Japan.

expensive for foreign buyers. Two cases and, of course, their combinations are possible. In one case, the exporter, after currency revaluation, does not lower the price expressed in domestic currency, therefore demand falls back or entirely ceases. In the other case, he lowers the price, which, in turn, worsens the profitability of exports; production may suffer losses and, in this connection, exports also fall back and economic growth is decelerating. Currency revaluation has further consequences, too, connected with the fact that imports become cheaper. A positive effect is that production costs and consumer prices are decreasing to a certain extent. At the same time, however, because of a strengthening import competition, they may get into a difficult situation, domestic producers may fail, which can decelerate economic growth *in addition* to retarding exports.

Economically, the approximation of the nominal to the PPP *exchange rate* seems to be reasonable. However, there is no such mechanism that would automatically ensure the emergence of an equilibrium (PPP) situation. One of its reasons is presumably that the exchange rate is a function of not only the commodity market but also of the capital market and generally the money market, which is a fundamental difference in relation to product prices. To this should be added the role of world economic conditions, as it is well demonstrated by Japan's example.

The connection between *terms of trade* and economic growth is also of complex character. It is an obvious relation that a more rapid export than import price increase results in a larger usable GDP, so there can be, for example, more investment. Besides, more profitable exports stimulate export growth, whereas an absolute or relative import cost reduction affects positively the whole economy. The opposite of all this happens if the terms of trade are deteriorating.

Changes in exchange rate and terms of trade can have an effect in both the same and the opposite direction. In Japan, until the first oil price explosion in 1973, both effects had been of a positive direction, they had mutually reinforced each other. It is no accident that this was the typical period of the Japanese "economic miracle". In the period of oil price explosions, namely in 1974-1985, the terms-of-trade effect changed sign, but the exchange rate effect remained still positive. The rate of economic development decreased, but exports were still growing relatively rapidly. A contrary situation emerged in the second half of the 1980s. The terms of trade greatly improved – on average by 30 percent as compared to the first half of the 1980s, chiefly in connection with oil price decline. However,

under the impact of the Plaza agreement, a currency shock happened, the yen's actual exchange rate rose on average by nearly 40 percent *above* the PPP value. In this situation, the volume of exports, in 1986-1987, significantly decreased; on five-year (1986-1990) average, it became larger by merely 3 percent per annum. At the same time, under the impact of an extraordinarily great improvement in terms of trade, investment was rapidly increasing (on average by 8.2 percent per annum), and the rate of economic growth also remained significant (4.8 percent per annum).

The prolonged recession unfolded when the exchange rate effect of negative direction became still stronger. In the first half of the 1990s, the revaluation of yen in relation to the PPP level had already exceeded even 60 percent. Moreover, the terms of trade began to worsen again, especially after 1995. The crisis which broke out in the early 1990s was caused by other circumstances, but *it was primarily the exchange rate effect of negative direction that lent prolonged character to the recession.* The growth of not only exports but also of investment decelerated; moreover, the latter decreased to zero in the average of period 1991-2003 and, what is gravest, the rate of economic growth fell back to a value around one percent (see the data sources in the Appendix).

The prolonged recession can be overcome only if the exchange rate lessens to the purchasing power parity level or below that. In recent years, there has been a certain shift to this direction. A further condition is that the terms of trade should not deteriorate markedly. In the latter respect, the situation is less favourable, in which, along with a renewed oil price increase, the strengthening Chinese competition has presumably a role.

THE ROLE OF GROWTH MECHANISM IN JAPAN'S ECONOMIC DEVELOPMENT

Concerning the supply factors, we are looking for an answer to the question what the fundamental *production factors* ensuring *output*, namely GDP, or value added, and the latter's growth are. There are *several* such *factors*; therefore, it is of the utmost importance to consider their interaction, which can be called *growth mechanism*, or mechanism of technical progress. In order to reveal *some general relations*, it is expedient to compare output to the main production factors (or vice versa) one by one. In special literature, the subjects of *such investigations* are most usually investment (*I*), capital stock (fixed capital, *K*) and labour (*L*).

Investment has above been examined as a *demand* factor, but we have referred to its role as a *supply* factor, too. In the former case, an *earlier* increment of GDP, as well as the replacement requirement of fixed capital, induces *later* investment with an approximately one-year lag; in the latter case, the situation is reversed: *earlier* investment induces *later* output and capital increments with also an approximately one-year lag. Thus, the two aspects of investment are relatively well separated from each other in time. It is customary to evaluate *the supply role of investment* on the basis of $I/\Delta Y$ ratio, the *ICOR indicator*,²⁷ which is very problematic, since the capital-replacing and labour-saving role of investment, as well as the time lag, is not considered. Taking the latter into consideration, namely using the $I_{t-1}/\Delta Y_t$ ratio, we calculated the indicator in point for Japan.²⁸ Regarding the whole investigated period (1951-2003), the ICOR indicator was 7.42; in the individual phases of development, however, it was very different from this, being 2.46 in the first phase (1951-1973), 6.92 in the second (1974-1990) and 21.09 in the third (1991-2003). It was on average 4.71 in the period of “economic miracle” (1951-1990), merely two-ninths of the result of the following prolonged recession. On the basis of all this, we can come to a conclusion that in the investigated period *investment efficiency* in Japan for the most part continuously worsened, in the highest degree after 1990, in the period of prolonged recession. However, we cannot disregard that the growing capital stock absorbed an increasing part of investment for replacement requirement and that with rising wages the share of labour-saving investment presumably expanded. Therefore, *the dynamics of investment efficiency seems to be worse on the basis of the ICOR indicator than in reality*.

Table 8: Capital intensity (K/Y) and labour productivity (Y/L) in Japan

1	Sphere	1950	1973	1990	2003
<i>K/Y</i>	National economy	2.26	2.11	2.70	3.42
	Manufacturing	2.02	1.62	2.09	2.77
<i>Y/L</i> 1950 = 1	National economy	1	5.44	8.64	10.12
	Manufacturing	1	8.19	16.34	23.63

Source: calculated from the Appendix.

27 See e.g. Erdős Tibor, “Mekkora lehet Magyarországon a fenntartható gazdasági növekedés üteme?”, op. cit.

28 On the basis of PPP dollar prices (at the price level of 1995), initial data see in the Appendix.

According to Table 8, *capital intensity* in Japan was tendentially increasing, except for the period 1951-1973, both in the entire national economy and manufacturing. That is, *capital efficiency*, apart from an improvement before the first oil price explosion, worsened, especially after 1990. At the same time, the performance of *manufacturing* in comparison with the whole economy improved, which can be more sharply observed in terms of *productivity*. What was the *role of productivity and staff increase* in Japan's economic growth? Using the relation $\Delta \ln Y = \Delta \ln(Y/L) + \Delta \ln L$, we obtained data in Table 9.

Table 9: Role of productivity and staff change in Japan's economic growth

($\Delta \ln Y = 100$)

Indicator	Sphere	1951-2003	1951-1973	1974-1990	1951-1990	1991-2003
$\ddot{\Delta} \ln(Y/L)$	National economy	80.9	82.3	72.8	80.1	93.5
	Manufacturing	83.4	72.2	94.3	76.6	249.1
$\ddot{\Delta} \ln L$	National economy	19.1	17.7	27.2	19.9	6.5
	Manufacturing	16.6	27.8	5.7	23.4	-149.1

Source: calculated from the Appendix.

In the entire investigated period (1951-2003), four-fifths of growth (in manufacturing five-sixths) was ensured by a rise in productivity; the situation was similar during the "economic miracle". After 1990, the role of increase in productivity became more dominant, particularly in manufacturing, where the number of employed significantly diminished.

At the same time, the ratio of employed and dependants in Japan was surprisingly favourable and moreover despite the longest average life expectancy of the Japanese in the world. In 1950 a Japanese employee had to support on average 1.23 unemployed, in 2003 a little over one.²⁹ The situation after 1990 somewhat deteriorated (from 0.98 to 1.02), in which, however, the growth of unemployment had a crucial role, since in contradiction to the 1.2 percent 1950 and 2.1 percent 1990 value, Japan's unemployment rate, in the period of prolonged recession until 2003, increased to 5.3 percent (calculated from the Appendix).

²⁹ For the sake of comparison, we note that in Hungary this ratio is approximately one and a half times as great as in Japan, though the former country's average life expectancy is much lower than the latter's.

The investigations expounded above indicate the tendencies but do not give an answer to *fundamental questions* and first of all to the question *whether the Japanese economic miracle was indeed a miracle*. We may hope to find an answer to such questions with the help of *more complex models*. We are to use two models: the standard neoclassical Solow model and an endogenous model. Both models are homogeneous of degree one; i.e., their use does not lead to economically absurd results.³⁰ The *standard neoclassical model*³¹ can be written down in the following form: $Y = A_0 K^\alpha L^{1-\alpha} e^{\lambda \Delta t}$, where Y is output, A_0 is a multiplier of efficiency, K is fixed capital, L is labour, t is time, Δt is the number of years ($t-t_0$) elapsed from some initial moment (t_0), α , $1-\alpha$ and λ are the elasticity of output by fixed capital, labour and time, respectively. The model assumes that, in a situation of equilibrium, the parameter α corresponds to the profit share (including the share of amortisation in the GDP), which regarding the developed countries is usually taken as 1/3. In that case, only the elasticity of output by time (λ), otherwise total factor productivity (TFP), must be estimated. In a formula:

$$\Delta \ln(Y/L) - 1/3 \Delta \ln(K/L) = \lambda \Delta t + \varepsilon \quad (2)$$

In relation (2), ε is a logarithmic residual. The expression $1/3 \Delta \ln(K/L)$ shows the effect of change in capital intensity (here K/L), which is the so-called *embodied technical progress*. Thus, *the standard neoclassical model assigns change in productivity to an effect of two factors: total factor productivity and embodied technical progress*. Having made a regression analysis by the least squares method, we obtained for the value of TFP in Japan the results summarised in Table 10.

Table 10: Total factor productivity (TFP) in Japan

Period	Number of observations	TFP (%)		R ²	
		National economy	Manufacturing	National economy	Manufacturing
1951-2003	53	3.48	4.61	0.646	0.770
1951-1973	23	5.45	6.71	0.988	0.981
1974-1990	17	1.07	2.01	0.849	0.903
1991-2003	13	0.0	0.39	0.0	0.230

30 Cf. Robert M. Solow, "Perspectives on Growth Theory", *Journal of Economic Perspectives*, Vol. 8, No. 1, Winter 1994, pp. 45-54.

31 Robert M. Solow, "A Contribution to the Theory of Economic Growth", *Quarterly Journal of Economics*, Vol. LXX, No. 1, February 1956, pp. 65-94.

As seen, *total factor productivity in Japan is an extremely unstable indicator*. Its specific magnitude changed very markedly in individual periods, both in the national economy and manufacturing. In manufacturing, the pulling sector of the economy, its value was higher than the national economy's average. To get a more complete picture of the *role* of factors affecting productivity *according to the neoclassical model*, we rearrange relation (2) (see below). The results are contained in Table 11.

Table 11: Factors of productivity growth in Japan according to the neoclassical model

Period	Indicator	National economy				Manufacturing			
		$\Delta \ln(Y/L)$	$1/3\Delta \ln(K/L)$	$\dot{\epsilon} \Delta t$	$\Delta \hat{a}$	$\Delta \ln(Y/L)$	$1/3\Delta \ln(K/L)$	$\dot{\epsilon} \Delta t$	$\Delta \hat{a}$
1951–2003	Annual Average	0.0437	0.0171	0.0343	-0.0077	0.0597	0.0219	0.0451	-0.0073
	%	100.0	39.1	78.5	-17.6	100.0	36.7	75.5	-12.2
1951–1973	Annual Average	0.0736	0.0241	0.0530	-0.0035	0.0917	0.0273	0.0649	-0.0005
	%	100.0	32.7	72.0	-4.7	100.0	29.8	70.7	-0.5
1974–1990	Annual Average	0.0272	0.0139	0.0106	0.0027	0.0407	0.0185	0.0199	0.0023
	%	100.0	57.1	39.0	9.9	100.0	45.5	48.9	5.6
1991–2003	Annual Average	0.0122	0.0102	0.0	0.0020	0.0284	0.0167	0.0039	0.0078
	%	100.0	83.6	0.0	16.4	100.0	58.8	13.7	27.5

$$\Delta \ln(Y/L) = 1/3\Delta \ln(K/L) + \lambda \Delta t + \Delta \epsilon \quad (2a)$$

Relation (2a) describes productivity growth broken down into three main components. The *first* component is the embodied technical progress, the *second* is total factor productivity and the *third* is the logarithmic residual ($\Delta \epsilon$). *TFP ensured the larger part of productivity growth in the entire investigated more than half a century period and therein in the typical period of “Japanese economic miracle”, 1951-1973, both in the national economy and manufacturing.*

A *fundamental problem* in connection with the neoclassical model is that *the concrete causes of changes in total factor productivity are not known*. It is primarily this problem that has been endeavoured to answer by the *endogenous growth models*. The most obvious explanation is that it is not enough to take only physical capital (fixed capital) into consideration, because in the modern economy a very significant role is played by human capital, the education of workers, and R&D activity. In essence, it is this

conception that took a concrete form in the endogenous growth models known from special literature.³²

Here we shall apply an *endogenous model*³³ making it possible not only to evaluate the role of fundamental growth factors (physical and human capital) but also to *compare joint factor efficiency (JFE) to the world level*, since the structure and parameters of the model were determined on the basis of data on 131 countries; in such a sense, a *world model* is at issue. The general form of the model is $Y = gM \exp[F_K(G_I + G_M + G_{HR})]$, where Y is the volume of output, namely GDP and value added, respectively, in dollars, at purchasing power parity, M is the number of working years, the parameter g is the output per working year produced *without fixed capital* (363 dollars at 1985 prices³⁴), F_K is the *capital intensity function* (approximately the natural logarithm of K/L ratio), K is fixed capital, L is the number of employed, G_I , G_M , G_{HR} are *functions determining the elasticity of output by capital intensity*, mapping the combined effect of physical and human capital, the mechanism of technical progress and essentially replacing the *constant* α of the neoclassical model. Namely:

$$G_I = 1 - \exp\{-F_K [g_I F_K \exp(g_L \Delta t \exp(-F_K/5)) + g_Z F_Z]\};$$

$$G_M = g_M F_K^2 \exp[-F_K/2 - g_{MZ} F_Z + g_O F_O \exp(-F_H^3/3)];$$

$$G_{HR} = g_{HR} (F_H F_R)^2 \exp(-F_K/3).$$

32 See e.g. Paul M. Romer, "Increasing Returns and Long-Run Growth", *Journal of Political Economy*, Vol. XCIV, No. 5, October 1986, pp. 1002-1037; Robert E. Lucas Jr., "On the Mechanics of Economic Development", *Journal of Monetary Economics*, Vol. XXII, No. 1, July 1988, pp. 3-42; N. Gregory Mankiw, David Romer and David N. Weil, "A Contribution to the Empirics of Economic Growth", *Quarterly Journal of Economics*, Vol. 107, No. 2, May 1992, pp. 407-437; Robert J. Barro and Xavier Sala-i-Martin, *Economic Growth*, MIT Press, Cambridge, Massachusetts, 2004. For a critical evaluation of endogenous models, see, among others, Robert M. Solow, "Perspectives on Growth Theory", op. cit.; Charles I. Jones, "R&D-Based Models of Economic Growth", *Journal of Political Economy*, Vol. CIII, No. 4, August 1995, pp. 759-784.

33 Simon György, "Növekedélmélet – világmodell – gazdaságfejlesztési stratégia", *Külgazdaság*, 49. évf., 3. sz., 2005. március, 31-51. old.

34 We converted the economic indicators at 1995 prices (see the Appendix) into the 1985 price level on the basis of US data, using the following indices (1995/1985): 1.331 for GDP, 1.187 for manufacturing value added, and 1.31 for fixed capital.

$\Delta t = t - 1950$, where 1950 is the base year. The estimated values of parameters are $g_I = 0.0033$, $g_L = 0.028$, $g_Z = 0.0372$, $g_M = 0.317$, $g_{MZ} = 0.43$, $g_O = 0.16$, $g_{HR} = 0.00883$.

In the *intensity functions* (see below), H is the number of schooling years, R_{t-2} is the number of scientists and engineers engaged in R&D two years before the reference year, Z is arable land in hectares, O_{t-1} is oil and natural gas resources in tonnes of oil equivalent at the end of the year preceding the reference year, n_K, n_H, n_R, n_Z, n_O are normalising coefficients.

$$F_K = \ln[(L+n_K K)/L]; F_H = \ln [(L+ n_H H)/L]; F_R = \ln [(L+ n_R R_{t-2})/L];$$

$$F_Z = \ln [(L+ n_Z Z)/L]; F_O = \ln [(L+ n_O O_{t-1})/L].$$

$$n_K = 1/0.250 \text{ (in dollars of 1985)}, n_H = 1; n_R = 1000, n_Z = 1; n_O = 1/200.$$

In the course of our investigation, we consider the parameters, including the normalising coefficients, as given. Analysing JFE with respect to labour productivity, we put *Japan's* factor values onto the right-hand side of the model (see the Appendix) and compare the productivity thus determined to the real one (in a logarithmic form). For a *global characterisation of differences*, a multiplier (a) is introduced, the value of which (\hat{a}) is estimated by the least squares method (G is the endogenous model, ε is the residual). In a formula:

$$\ln(Y/M) = \hat{a} \ln(G/M) + \varepsilon \quad (3)$$

Table 12. Japan's joint factor efficiency (JFE)
as compared to the world level

Period	Number of observations	National economy				Manufacturing			
		\hat{a}	Se (\hat{a})	t statistic	R ²	\hat{a}	se (\hat{a})	t statistic	R ²
1951-2003	53	1.00	0.14	7.21	0.985	1.00	0.14	7.21	0.989
1951-1973	23	1.04	0.23	4.69	0.986	1.05	0.22	4.69	0.983
1974-1990	17	1.04	0.26	4.00	0.987	1.03	0.26	4.00	0.970
1991-2003	13	1.05	0.30	3.46	0.672	1.05	0.30	3.46	0.883

Data in Table 12 show that *Japan's joint factor efficiency did not depart significantly from the world level*, either in the national economy or manufacturing, therefore the "*Japanese economic miracle*" existed only in the vocabulary of mass media. At the same time, it cannot be stated either that after 1990 the Japanese economy functions much less efficiently than before. *How can one then explain* the extraordinarily rapid economic

development, mainly until the first oil price explosion, as well as the prolonged recession? *Two main causes* can be noted: (1) the increase in the volume of production factors was decelerating; (2) at a higher stage of development, growth mechanism functions differently, which is mostly, but not always, effective in the direction of a slower rise in productivity.

Table 13: Dynamics of production factors in Japan
(average annual change, %)

Period	National economy				Manufacturing		
	<i>L</i>	<i>K</i>	<i>H/L</i>	<i>R_{t,2}</i>	<i>L</i>	<i>K</i>	<i>R_{t,2}</i>
1951-2003	1.04	6.37	0.32	7.49	1.20	8.07	7.47
1951-1973	1.60	9.02	-0.26	13.38	3.58	12.42	13.26
1974-1990	1.02	5.32	0.93	4.24	0.25	5.98	4.53
1991-2003	0.09	3.19	0.55	1.82	-1.68	3.37	1.55

The dynamics of most important growth factors with a view to Japan, figuring in the endogenous model, is contained in Table 13 (on the basis of Appendix data). It can be stated that, in comparison with the first phase of economic development (1951-1973), the growth rate of all the main production factors considerably decreased further on, except for education in the second phase.³⁵ In all this, oil price explosions and a related deterioration in terms of trade must have had a great role, as well as still more the *currency shock* after 1985, a set-back in *profitability* and *exports* that occurred under its impact, as already discussed above.

To analyse productivity growth using the *endogenous model*, we apply relation (3a). The empirical results are contained in Table 14.

$$\Delta \ln(Y/gM) = \Delta F_K (G_I + G_M) + \Delta F_K G_{HR} + \Delta \varepsilon \quad (3a)$$

Relation (3a) shows productivity rise broken down into three main components. In the first component, the effect of human capital does not explicitly appear.³⁶ By contrast, *the second component depends on the combined effect of education and R&D. The third component ($\Delta \varepsilon$) essentially characterises the differences from international efficiency.*

It can be stated that *economic growth and productivity change in Japan, considering the whole investigated more than half a century period*

35 In the case of education, the negative value of the first phase of development is presumably connected with the aftermath of World War II.

36 Education functions primarily as an *implicit* factor of complementary character. It should be noted that, in the model, the effect of *learning by doing* is taken into consideration, in function *GI* rical results.

Table 14: Factors of productivity growth in Japan
on the basis of the endogenous model

Period	Indicator	National economy				Manufacturing			
		$\Delta \ln(Y/gM)$	$\Delta F_K(G_I + G_M)$	$\Delta F_K G_{HR}$	$\Delta \hat{a}$	$\Delta \ln(Y/gM)$	$\Delta F_K(G_I + G_M)$	$\Delta F_K G_{HR}$	$\Delta \hat{a}$
1951–2003	Annual average	0.0437	0.0384	0.0043	0.0010	0.0597	0.0507	0.0087	0.0003
	%	100.0	87.9	9.8	2.3	100.0	84.9	14.6	0.5
1951–1973	Annual average	0.0736	0.0570	0.0051	0.0115	0.0917	0.0742	0.0097	0.0078
	%	100.0	77.5	6.9	15.6	100.0	80.9	10.6	8.5
1974–1990	Annual average	0.0272	0.0273	0.0044	-0.0045	0.0407	0.0367	0.0091	-0.0051
	%	100.0	100.4	16.1	-16.5	100.0	90.2	22.3	-12.5
1991–2003	Annual average	0.0122	0.0199	0.0026	-0.0103	0.0284	0.0273	0.0066	-0.0055
	%	100.0	163.1	21.3	-84.4	100.0	96.1	23.2	-19.3

(1951-2003), proceeded in conformity with the international standards of efficiency (see Table 14). Thus, this investigation, too, corroborates that no “economic miracle” has happened. At the same time, in the first phase of development (1951-1973), the favourable circumstances (good terms of trade, strongly devalued Japanese currency, putting of unutilised capacities into operation) yielded temporarily a certain surplus result, which, however, was lost in the second and chiefly in the third phase, substantially in connection with the reasons outlined above.

Our empirical results show that *human capital, namely education and research and development activity significantly promoted the growth of Japanese economy, not only implicitly but also explicitly, especially in manufacturing. It is not difficult to calculate that the combined partial effect of the two factors at issue, regarding the entire period, increased by over 25 percent the national economy’s and by about 60 percent manufacturing productivity and output, i.e., GDP and value added, respectively, in Japan.*

CONCLUSIONS

The regularities of the globalising world economy are uniform; therefore, whichever country or region is analysed, information is obtained regarding our own problems, too. The investigation of *Japan’s economic development* is particularly exciting because one of the most advanced countries in the world is at issue, which in the past more than half a century consecutively showed examples of extraordinarily rapid and then very slow economic growth. What made the former possible and what caused the

latter? Essentially, this is the *double enigma* that we have attempted to solve in the present paper.

The “Japanese economic miracle” actually *was not a miracle*. The growth that was extremely rapid but conformable with the efficiency standards of the world economy was ensured by an economic policy based on co-operation between the government and business community under *international economic conditions favourable for Japan*. The latter implied first of all favourable terms of trade and a *national currency strongly depreciated* against the dollar. The Japanese economy came to a *crisis* when international conditions became unfavourable for the country – there came two oil price explosions and then a currency shock. It was especially the latter’s effect that proved to be permanent and grave, causing a *prolonged recession*, begun in the early 1990s, from which the country did not manage to recover to the present day, despite several efforts to overcome it.

Why did the attempts at crisis management not succeed? They were unsuccessful essentially because their aim was not to eliminate the true cause by surmounting the currency shock, namely to reduce the price of currency to a real level or below that. Many things were tried, as mentioned above, but *without* eliminating the fundamental cause of the crisis, they could not have yielded an adequate result.

What lessons can be drawn from the investigation of Japan’s economic development and economic policy? In our opinion, the main lesson is the significance of exchange rate policy that should be in compliance with national interests, which is, through export promotion, probably the most important key to rapid economic growth in open economies, such as Serbia and Montenegro or Hungary.

Appendix 1

Initial data for Japan

Year	National economy								Manufacturing			
	<i>Y</i>	<i>N</i>	<i>L</i>	<i>K</i>	<i>H/L</i>	<i>R_{t,2}</i>	<i>Z</i>	<i>O_{t,1}</i>	<i>Y</i>	<i>L</i>	<i>K</i>	<i>R_{t,2}</i>
	USD 10 ⁹	millions	millions	USD 10 ⁹	years per emp- loyed	thou- sands	10 ⁶ hecta- res	10 ⁶ ton- nes	USD 10 ⁹	millions	USD 10 ⁹	thou- sands
1949	148.7	-	36.87	-	-	-	-	-	-	-	-	-
1950	175.3	83.59	36.54	397	8.12	14.7	5.05	3	17.0	6.42	34.3	9.7
1951	195.8	84.96	36.80	411	8.09	16.9	5.10	3	21.6	6.65	36.7	11.0
1952	219.1	86.25	37.62	428	8.05	19.4	5.09	3	22.3	6.71	40.0	12.6
1953	235.3	87.45	38.07	447	8.01	22.4	5.08	3	25.6	6.98	43.1	14.3
1954	248.6	88.76	39.65	471	7.98	25.8	5.07	3	27.1	7.39	46.6	16.7

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Year	National economy								Manufacturing			
	<i>Y</i>	<i>N</i>	<i>L</i>	<i>K</i>	<i>H/L</i>	<i>R_{t-2}</i>	<i>Z</i>	<i>O_{t-1}</i>	<i>Y</i>	<i>L</i>	<i>K</i>	<i>R_{t-2}</i>
	USD 10 ⁹	millions	millions	USD 10 ⁹	years per employed	thousands	10 ⁶ hectares	10 ⁶ tonnes	USD 10 ⁹	millions	USD 10 ⁹	thousands
1955	269.9	89.82	41.19	496	7.95	29.8	5.06	4	29.1	7.56	50.9	19.2
1956	290.1	90.76	41.79	522	7.92	34.4	5.05	4	35.8	8.05	55.3	22.1
1957	311.0	91.56	43.03	554	7.89	39.6	5.61	4	40.6	8.53	61.4	25.7
1958	329.9	92.39	43.24	590	7.85	45.6	6.07	5	40.6	9.00	68.1	29.2
1959	366.0	93.29	43.68	630	7.82	52.8	6.07	6	49.2	9.01	75.5	34.0
1960	406.7	94.10	44.61	676	7.78	60.9	6.07	9	61.7	9.51	84.4	41.0
1961	466.5	94.95	45.18	739	7.74	70.2	6.01	11	73.6	10.16	97.3	45.4
1962	498.7	95.83	45.74	818	7.70	81.0	6.02	14	80.3	10.72	114	52.5
1963	551.1	96.81	46.13	905	7.67	93.4	6.02	18	95.8	11.12	132	60.4
1964	623.9	97.83	46.73	1001	7.63	108	6.03	18	104.0	11.37	154	69.0
1965	655.9	98.88	47.48	1097	7.59	125	6.00	17	108.1	11.57	173	79.9
1966	725.4	99.79	48.47	1271	7.56	143	6.00	18	122.6	11.87	202	93.5
1967	803.5	100.83	49.20	1404	7.53	166	5.94	19	147.0	12.52	225	107
1968	906.1	101.96	50.02	1580	7.51	182	5.90	20	169.7	13.05	260	117
1969	1017	103.17	50.40	1795	7.48	195	5.75	21	197.5	13.45	303	126
1970	1117	104.34	50.94	2057	7.45	219	5.80	20	234.3	13.77	380	141
1971	1169	105.70	52.21	2342	7.51	234	5.74	19	248.8	13.83	411	151
1972	1272	107.19	51.26	2614	7.58	254	5.68	18	275.3	13.83	460	164
1973	1372	108.71	52.59	2892	7.65	264	5.65	17	312.9	14.43	507	170
1974	1355	110.16	52.37	3154	7.71	270	5.62	20	312.3	14.27	555	173
1975	1390	111.57	52.23	3403	7.78	305	5.57	23	293.2	13.46	599	196
1976	1457	112.77	52.71	3633	7.92	318	5.54	25	322.7	13.45	636	206
1977	1534	113.86	53.42	3843	8.06	336	5.52	22	340.4	13.40	668	214
1978	1609	114.90	54.08	4041	8.21	340	5.49	19	355.5	13.26	696	215
1979	1698	115.87	54.79	4258	8.36	345	5.47	19	384.0	13.33	726	217
1980	1759	116.81	55.36	4492	8.51	346	5.46	19	407.4	13.67	763	218
1981	1811	117.66	55.81	4741	8.56	355	5.44	19	421.9	13.85	805	223
1982	1861	118.48	56.38	4853	8.60	374	5.43	22	432.9	13.80	849	238
1983	1891	119.31	57.33	5043	8.65	393	5.41	26	441.4	14.06	893	253
1984	1950	120.08	57.66	5228	8.69	406	5.40	30	464.5	14.38	941	264
1985	2049	120.84	58.07	5514	8.74	435	5.38	30	511.1	14.53	1003	285
1986	2115	121.49	58.53	5806	8.78	448	5.36	31	509.0	14.44	1067	296
1987	2190	122.09	59.11	6045	8.83	473	5.34	31	527.1	14.25	1124	314
1988	2338	122.58	60.11	6335	8.87	488	5.32	33	569.4	14.54	1185	326
1989	2461	123.07	61.28	6646	8.92	513	5.28	35	606.0	14.84	1265	344
1990	2589	123.48	62.49	6983	8.96	535	5.24	38	651.3	15.05	1361	361
1991	2676	123.97	63.69	7376	9.01	560	5.20	37	684.0	15.50	1469	381
1992	2702	124.37	64.36	7758	9.07	583	5.16	36	670.5	15.69	1570	390
1993	2709	124.75	64.50	8096	9.12	598	5.12	34	680.6	15.30	1644	398
1994	2739	125.12	64.53	8401	9.18	622	5.08	34	636.5	14.96	1698	420
1995	2792*	125.47	64.57	8678**	9.23	641	5.04	34	662.8***	14.56	1750**	426
1996	2888	125.82	64.86	8953	9.28	659	4.99	34	690.9	14.45	1785	430
1997	2942	126.15	65.57	9228	9.33	673	4.95	35	714.3	14.42	1846	440
1998	2909	126.47	65.14	9511	9.37	617	4.91	35	671.9	13.82	1908	403
1999	2912	126.77	64.62	9746	9.42	625	4.87	34	683.1	13.45	1948	408
2000	2995	127.03	64.46	9964	9.47	653	4.83	34	732.3	13.21	1993	426
2001	3009	127.27	64.12	10174	9.52	659	4.79	33	707.5	12.84	2042	430
2002	2993	127.49	63.30	10363	9.57	648	4.76	33	689.2	12.22	2070	423
2003	3067	127.65	63.16	10502	9.62	676	4.73	32	755.2	12.07	2093	441

* US Dollar 1 = Yen 178; ** US Dollar 1 = Yen 184; *** US Dollar 1 = Yen 173.

Note: Value data (*Y*, *K*) were determined in dollars of 1995 at PPP. *Y* is GDP (national economy) and value added (manufacturing), respectively. *K* is average annual gross fixed capital (with dwellings). The conversion into PPP was made on the basis of Eurostat data.

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N is the average annual number of population and L is that of the employed, H is the number of schooling years for population aged 15 and over. R_{t-2} is the number of scientists and engineers engaged in R&D, considering a two-year lag. Z is arable land; O_{t-1} is oil and natural gas resources in tonnes of oil equivalent at the end of the year preceding the reference year. Our investigation comprised the period after 1950. For 1949, data relevant in view of the time lag are shown.

Sources: National Accounts Statistics, UN, New York; National Accounts, OECD, Paris; Statistical Yearbook, UN, New York; Japan Statistical Yearbook, Statistics Bureau, Tokyo; International Financial Statistics Yearbook, IMF, Washington, D.C.; Yearbook of Labour Statistics, ILO, Geneva; UNESCO Statistical Yearbook, Paris; Flows and Stocks of Fixed Capital, OECD, Paris; FAO Production Yearbook, Rome; Energy Statistics Yearbook, UN, New York; White Paper of Japan, Government of Japan, Tokyo, various volumes; Robert J. Barro and Jong-Wha Lee, "International Data on Educational Attainment: Updates and Implications", Center for International Development at Harvard University, *CID Working Paper*, No. 42, Cambridge, Massachusetts, 2000. Appendix Data Tables: Internet, 11/06/01, <http://www.cid.harvard.edu/ciddata/ciddata.html>; Alan Heston, Robert Summers and Bettina Aten, *The Penn World Table Version 6.1.*, Center for International Comparisons at the University of Pennsylvania (CICUP), October 2002; Economic and Social Research Institute, Tokyo, Internet, 15/07/05, <http://www.esri.cao.go.jp>

Appendix 2

Japan and the United States: additional initial data

Year	Investment		GDP deflator		U	Price indices		Yen/dollar		Exports	Imports	C	
	USD 10 ⁹	Price Index	Japan	USA	thousands	Exports	Imports	Actual	Real	Yen 10 ¹²		Price index	Yen 10 ¹²
1949	-	-	-	-	380	1.149	1.091	-	-	-	-	1.076	-
1950	21.3	1	1	1	444	1	1	361.1	149	0.487	0.444	1	28.1
1951	23.8	1.453	1.153	1.072	409	1.382	1.208	361.1	160	0.651	0.721	1.105	29.8
1952	26.6	1.508	1.173	1.090	457	1.234	1.094	361.1	160	0.719	0.796	1.189	34.6
1953	30.7	1.591	1.247	1.104	423	1.066	0.996	360	168	0.831	1.047	1.306	37.8
1954	33.0	1.613	1.253	1.114	563	1.055	0.899	360	167	0.910	1.167	1.386	39.4
1955	33.7	1.586	1.267	1.134	755	1.066	0.866	360	166	1.046	1.235	1.398	41.7
1956	40.9	1.757	1.327	1.173	726	1.069	0.880	360	168	1.278	1.630	1.430	44.1
1957	48.4	1.912	1.387	1.212	611	1.102	0.894	360	170	1.402	2.058	1.495	46.2
1958	50.7	1.823	1.327	1.240	614	1.095	0.897	360	159	1.402	1.513	1.505	41.2
1959	57.9	1.862	1.380	1.255	665	1.014	0.773	360	164	1.770	2.118	1.536	52.8
1960	75.8	1.934	1.487	1.273	496	1.051	0.765	360	174	1.973	2.629	1.612	57.4
1961	96.8	2.066	1.460	1.287	456	1.029	0.744	360	169	2.109	3.343	1.715	62.0
1962	107.7	2.083	1.640	1.304	415	1.016	0.936	360	187	2.463	3.319	1.823	67.8
1963	119.1	2.083	1.713	1.320	419	1.038	0.733	360	193	2.643	3.917	1.955	74.2
1964	138.9	2.122	1.753	1.337	377	1.060	0.783	360	195	3.199	4.470	2.059	82.0
1965	143.5	2.138	1.880	1.365	383	1.064	0.767	360	205	3.922	4.785	2.204	86.7
1966	162.0	2.227	1.973	1.404	440	1.087	0.796	360	209	4.483	5.375	2.334	94.2
1967	192.2	2.315	2.087	1.443	648	1.100	0.779	360	215	4.742	6.630	2.443	103.5
1968	237.1	2.359	2.193	1.510	608	1.112	0.787	360	216	5.820	7.415	2.595	112.5
1969	280.0	2.436	2.307	1.582	561	1.143	0.811	360	217	6.940	8.417	2.760	122.6
1970	321.4	2.547	2.467	1.666	567	1.199	0.839	360	220	7.994	10.22	2.967	133.1
1971	334.9	2.591	2.593	1.749	634	1.215	0.839	350.7	221	9.415	10.60	3.158	141.7
1972	370.0	2.680	2.733	1.827	728	1.181	0.801	303.2	223	10.02	11.71	3.336	155.1
1973	426.1	3.044	3.080	1.933	693	1.265	0.941	271.7	238	10.79	14.67	3.701	168.9
1974	386.1	3.878	3.720	2.100	744	1.668	1.491	292.1	263	13.24	15.85	4.497	170.9

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Year	Investment		GDP deflator		U thou- sands	Price indices		Yen/dollar		Exports Yen 10 ¹²	Imports Yen 10 ¹²	C	
	USD 10 ⁹	Price Index	Japan	USA		Exports	Imports	Actual	Real			Price index	Yen 10 ¹²
1975	378.0	3.983	4.007	2.301	1012	1.665	1.612	296.8	259	13.79	14.40	5.027	178.7
1976	390.3	4.166	4.293	2.429	1076	1.629	1.656	296.6	263	16.76	15.74	5.436	186.5
1977	410.5	4.287	4.547	2.585	1090	1.567	1.584	268.5	262	18.76	16.46	5.828	193.6
1978	451.7	4.304	4.773	2.769	1217	1.441	1.309	210.4	256	19.08	17.97	6.056	204.5
1979	478.4	4.591	4.907	2.997	1175	1.557	1.237	219.1	244	19.90	20.29	6.283	217.0
1980	476.5	4.978	5.133	3.270	1130	1.709	2.296	226.7	235	23.28	18.71	6.743	220.0
1981	487.4	5.066	5.360	3.577	1255	1.754	2.344	220.5	223	26.20	18.79	7.048	224.2
1982	486.4	5.133	5.673	3.794	1386	1.801	2.499	249.1	215	26.45	18.32	7.231	233.5
1983	481.1	5.133	5.600	3.944	1530	1.715	2.364	237.5	211	27.70	17.77	7.379	241.1
1984	501.7	5.193	5.780	4.089	1600	1.714	2.303	237.5	210	31.80	19.63	7.574	247.2
1985	526.7	5.232	5.913	4.217	1550	1.670	2.252	238.5	209	33.53	19.35	7.764	254.3
1986	552.0	5.188	6.013	4.312	1686	1.457	1.541	168.5	207	31.62	19.73	7.814	263.8
1987	602.5	5.149	6.033	4.429	1703	1.393	1.430	144.6	203	31.45	21.61	7.850	273.9
1988	671.5	5.166	6.073	4.579	1541	1.361	1.364	128.2	197	33.32	26.13	7.894	287.2
1989	717.8	5.331	6.213	4.752	1443	1.408	1.455	138.0	194	36.36	30.99	8.080	299.7
1990	780.6	5.475	6.367	4.936	1340	1.430	1.617	144.8	192	38.82	32.51	8.316	311.7
1991	797.9	5.613	6.553	5.109	1366	1.399	1.533	134.7	191	40.42	32.16	8.548	320.4
1992	779.0	5.663	6.127	5.226	1448	1.364	1.456	126.7	190	42.00	31.94	8.707	328.8
1993	757.2	5.635	6.693	5.348	1654	1.273	1.335	111.2	186	40.97	31.49	8.795	334.6
1994	745.7	5.586	6.700	5.460	1927	1.234	1.279	102.2	183	43.43	33.93	8.841	343.6
1995	751.3*	5.525	6.667	5.572	2135	1.211	1.261	94.1	178	45.23	38.27	8.830	351.6
1996	779.7	5.448	6.613	5.617	2283	1.246	1.368	108.8	173	48.16	43.32	8.840	360.5
1997	806.9	5.442	6.633	5.772	2300	1.267	1.446	121.0	171	53.58	43.86	8.977	363.9
1998	775.5	5.354	6.627	5.833	2790	1.274	1.407	130.9	169	52.34	40.86	8.916	365.3
1999	768.7	5.215	6.527	5.922	3170	1.166	1.296	113.9	164	53.10	42.09	8.834	369.3
2000	789.4	5.232	6.393	6.050	3200	1.121	1.311	107.8	157	59.68	46.08	8.728	376.1
2001	782.2	5.000	6.300	6.195	3400	1.136	1.351	121.5	151	56.03	46.10	8.629	383.1
2002	744.3	4.856	6.227	6.301	3590	1.115	1.325	125.4	147	60.65	47.03	8.499	389.2
2003	778.1	4.597	6.073	6.429	3500	1.068	1.301	115.9	141	66.74	49.30	8.590	393.5

* US Dollar 1 = Yen 184.

Note: The value of investment (gross fixed capital formation) is given in dollars of 1995 at PPP. *U* is the number of unemployed; *C* is consumption (at the price level of 1995). Exports and imports contain goods and services (at 1995 prices). The yen/dollar real exchange rate was determined considering the 1995 PPP for GDP (178 yen/dollar) and the GDP deflators of Japan and the United States. Price indices were determined on the basis of OECD National Accounts (referring to the 1950 base).

Source: see Appendix 1.

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JAPANSKA EKONOMSKA ZAGONETKA

REZIME

Japanska privreda je posle Drugog svetskog rata dugo vreme predstavljala najdinamičnije razvijajući deo svetske privrede. Stoga je izraz “Japansko ekonomsko čudo” ušao je u leksikon medija, gde je ostao sve do devedesetih godina prošlog veka, kada ga je neočekivan zaokret, naime produžena recesija učinila zastarelim. Zakonitosti globalizujuće svetske privrede su jedinstvene. Analizirajući ma koji od njenih delova, dobićemo informaciju i o svojim sopstvenim problemima. Istraživanje privrednog razvoja Japana je naročito zanimljivo, jer ovo je jedna od najrazvijenijih zemalja u svetu, koja je u proteklom razdoblju od više od pola stoleća pokazivala primere izvanredno brzog, a zatim vrlo sporog privrednog rasta.

Zašto se sve to dogodilo? U suštini, to je dvojna zagonetka koju su pokušali rešiti autori ovog članka. Primenjujući endogeni model rasta, oni su pokazali da u stvari u Japanu nije bilo nikakvog ekonomskog čuda: vrlo brzi rast se odvijao u skladu sa opštim zakonitostima privrednog razvoja. Prema njihovim empirijskim rezultatima, osnovni uzrok produžene recesije nije stečaj, nakon perioda sustizanja, tzv. razvojne države, ili regulisane tržišne ekonomije, stvorene tokom “privrednog čuda”, već valutni šok koji se desio pod spoljnim pritiskom sredinom osamdesetih godina i koji je prekinuo dotadašnji izvanredno dinamični uspon japanskog izvoza, značajno sprečivši glavni činilac ubrzanog privrednog rasta. Zato je proučavanje privrednog razvoja Japana skreće pažnju na izvanrednu važnost valutne politike, osobito za otvorene ekonomije.

U razdoblju od 1951. do 1973. godine izvanredno brz rast japanske privrede bio je obezbeđen ekonomskom politikom zasnovanom na saradnji između države i biznis zajednice u međunarodnim uslovima privređivanja povoljnim za zemlju. Poslednji su podrazumevali pre svega povoljne uslove trgovine (terms of trade) i nacionalnu valutu od jako umanjene vrednosti u odnosu na dolar. Japanska privreda je pala u krizu, kada su međunarodni uslovi postali nepovoljni za zemlju: 1973. i 1979. godine došlo je do dva naftna šoka, a zatim nakon tzv. Plaza sporazuma, sklopljenog u septembru 1985. godine, i do valutnog šoka. Efekat poslednjeg se pokazao kao naročito permanentan i težak, izazvavši od početka devedesetih godina produženu recesiju, od koje zemlja sve do danas nije mogla da se oporavi, uprkos brojnim pokušajima da se ona prebrodi.

Antikrizne mere nisu bile uspešne uglavnom zbog toga što one nisu bile usmerene na uklanjanje stvarnog uzroka recesije, već na prebrođavanje valutnog šoka, naime na snižavanje cene valute do realnog nivoa, ili niže od njega. Japanski

političari i privrednici su pokušali mnoge stvari, ali bez uklanjanja osnovnog uzroka krize nisu mogli dobiti potreban rezultat.

Kakve pouke je moguće izvući iz istraživanja privrednog razvoja Japana i njegove ekonomske politike? Prema mišljenju autora, glavna pouka je u tome da valutna politika mora biti u skladu sa nacionalnim interesima. Ona jeste, kroz podsticanje izvoza, verovatno najvažniji ključ ubrzanog privrednog rasta u vrlo otvorenim ekonomijama kao što su Srbija i Crna Gora ili Mađarska. Model prikazan u članku, u konkretizaciji za datu zemlju, može služiti kao osnov za izradu takve politike.