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EDITORIAL

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Here with another edition of *GEM* which we hope, as always, teachers will find of use. The past year has not been a kind one to any of us here in Zimbabwe, and the Association has not escaped unscathed from the current financial crisis which has seen the rapid escalation of printing and postage costs. Our traditional printers increased their charges nearly five fold, while the standard of their work has declined sharply. We have thus been obliged to take the magazine to a commercial firm, but this is expensive although I am delighted as to the quality.

The National Council was certainly caught on the wrong foot and we had serious discussions as what to do next. At one stage we thought that we might have to close down *GEM* completely as we just did not (and still do not) have adequate funds to see it through. However, after many hours serious thought we have opted to struggle on, however, there will have to be cutbacks. We have reduced the print size somewhat to get more material on fewer pages, and we are really sorry but Corporate Members will henceforth receive only one copy of *GEM*—as is the situation with *GJZ*. This was brought to the National Council AGM in August and was ratified by that forum. Those of you reading this editorial will already be aware of the drastic increase in subscriptions which was necessitated in order to try and cover the cost of the publications. We will struggle on with the production of *GEM*, but I warn members that the situation is precarious.

The membership of Geographical Association of Zimbabwe can proudly boast of being part of the only operative subject Association in the field of Education in Zimbabwe today. However, with the sharp, unavoidable, increases in subscriptions we have witnessed a marked decline in our membership. This is reducing revenues further and threatens the very existence of the Association. We therefore **STRONGLY** encourage all members to canvas around to increase membership—both lapsed and new members. It would be sad if we ceased to function.

Robert S. Burrett
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October 1999

ECONOMIC GROWTH OF JAPAN WITH SPECIAL REFERENCE TO INDUSTRIAL DEVELOPMENT

by

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INTRODUCTION

Japan's economic success has been a characteristic of the second half of the twentieth century. Its industrial revolution took 120 years whereas Britain took nearly twice that period to become a major industrial nation. Industrialisation proceeded fairly rapidly because Japan built on Western innovation, while at the same time striving to eliminate the mistakes of the Western countries. What makes the growth of the economy more remarkable is a background of extreme resource scarcity. Japan is poorly endowed with most resources. That the Japanese were able to assemble many raw materials from every corner of the world makes their achievement spectacular.

This paper examines the growth of the Japanese economy. Special reference is paid to industrial growth and the changing character of industries in response to changing demand. Initially an outline of Japan's physical environment is presented to show the limited resources available for industrialisation, as well as the perils posed by Japan's physical environment. The section that follows presents a survey of the growth of Japan's economy from pre-Meiji times (before 1868) to the 1990s. In this, Japan's economic growth is assessed in terms of Rostow's model of economic development. The paper concludes with a description of some of the problems currently facing the Japanese economy.

THE PHYSICAL ENVIRONMENT

Japan—land of the rising sun—is situated to the north west of the Pacific Ocean. It stretches for 3 000 kilometres north to south, from latitude 20°N to 45°N. Japan can be regarded as an "Island nation" or "a nation of islands" (Witherick and Carr, 1993, p.19). There are four main islands namely Hokkaido, Honshu, Shikoku and Kyushu (Figure 1). These islands are of varying sizes (see Table 1) and, according to the Japan

Festival Education Trust (1994a) they are part of a chain of volcanic mountains running across southeast Asia to Alaska. More than 75% of Japan is classified as mountainous with mountains covering the central parts of the main islands. In addition, most of the islands are located at the junction of the Eurasian, Pacific, North American and Philippine tectonic plates (Figure 2). It is therefore not surprising that Japan has over 60 active volcanoes and experiences upwards of 7000 earthquakes annually (Japan Festival Education Trust, 1994a; Japan Festival Education Trust, 1994b). De Blij and Muller (1994) point out that Japan experiences at least one devastating earthquake in every 70 or so years (the 70-year rule). These are accompanied by heavy property destruction and the loss of life.

Japan is also located where two main ocean currents meet—the warm Kuroshio Current flowing north, the cold Oyashio Current flowing south.

These bring warm and cold air masses with them and on meeting with three other local air masses, fierce tropical storms are created.

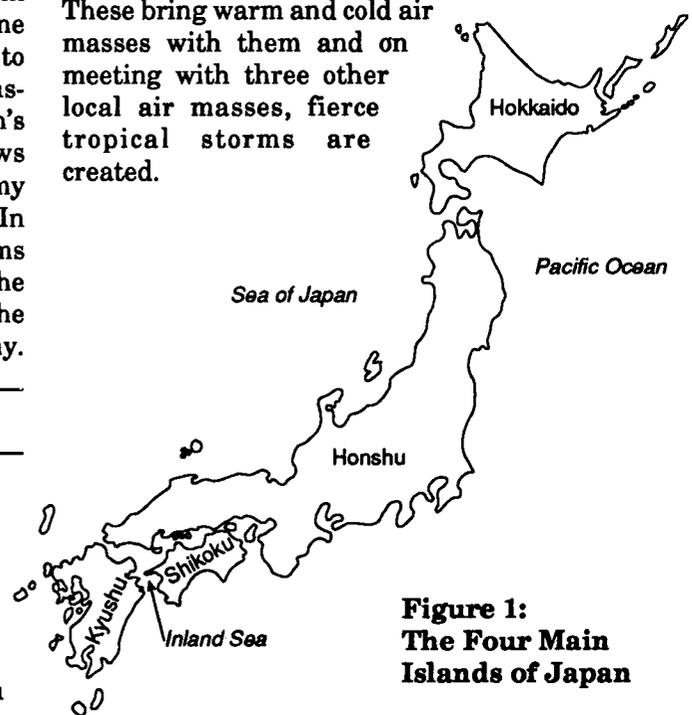


Figure 1:
**The Four Main
Islands of Japan**

Source: Japan Festival Education Trust, 1994a, p.37

Table 1: The Islands of Japan

	Number of Islands	Area (km ²)	Area of main Islands (km ²)	Length of Coastline (km ²)	Area per km of Coastline (km ²)
Hokkaido	263	83 520	78 073	2 447	31.9
Honshu	1 546	231 090	227 414	8 298	27.4
Shikoku	472	18 808	8 256	1 797	10.2
Kyushu	1 420	42 163	36 554	3 206	11.4
Okinawa	221	2 225	1 185	470	2.5
Japan	3 922	377 835	361 483	16 218	22.3

(Source: Witherick and Carr, 1993, p.19)

All these physical factors do not thus appear to be favourable for economic development. However, on the positive side, as Witherick and Carr (1993) note, the physical environment yields a number of resources, ranging from water and timber to minerals and energy which are crucial to human progress. Japan has abundant fresh water supplies and nowhere else does water interdigitate as much with land as in Japan, where there is a long coastline relative to its area (1 km of coastline for every 22km²) compared with the British Isles with a ratio of 1 to 31 (Witherick and Carr, 1993). However, 'Japan's mineral resources are characterised by their variety rather than by their quantity' and many reserves have now been exhausted (Cole, 1996, p.186).

ROSTOW'S MODEL OF ECONOMIC GROWTH

Rostow (1960) identified five stages through which an economy of a country should pass:

1. The traditional society;
2. Pre-conditions for take-off;
3. Take-off;
4. Drive to maturity; and
5. Age of high mass consumption.

The first stage is characterised by an inward looking traditional society whose economic activities are dominated by agriculture. Economic growth is then speeded up during the second stage. According to Rostow (1960) external influences from advanced societies help in transforming these traditional societies. The taking over of power by the young generation then ushers a country into the third stage (Rostow, 1960). Stage three marks the beginning of steady growth. According to Rostow (1960, p.7) 'the old blocks and resistance to steady growth are finally overcome in this stage. The fourth stage sees a consolidation of the newly industrialised society. Investment grows and large

urban regions develop' (Whyne-Hammond, 1985). The fifth stage is a stage of high mass consumption in which 'a country demonstrates that it has the technical and entrepreneurial skills to produce everything and anything that it chooses to produce' (Rostow, 1960, p.10). This stage is marked by high incomes, mass production of consumer goods and services (De Blij and Muller, 1994).

Rostow's model, according to De Blij and Muller (1994) does not successfully represent the advanced economics of the 1990s and they suggest a sixth stage to the model—the post-industrial society characterised by ultra-sophisticated technology and the provision of services. This sixth stage contrasts with that suggested by Whyne-Hammond (1985), that is, a stage of economic depression. This essay discusses in how far Japan fits into the categories described.

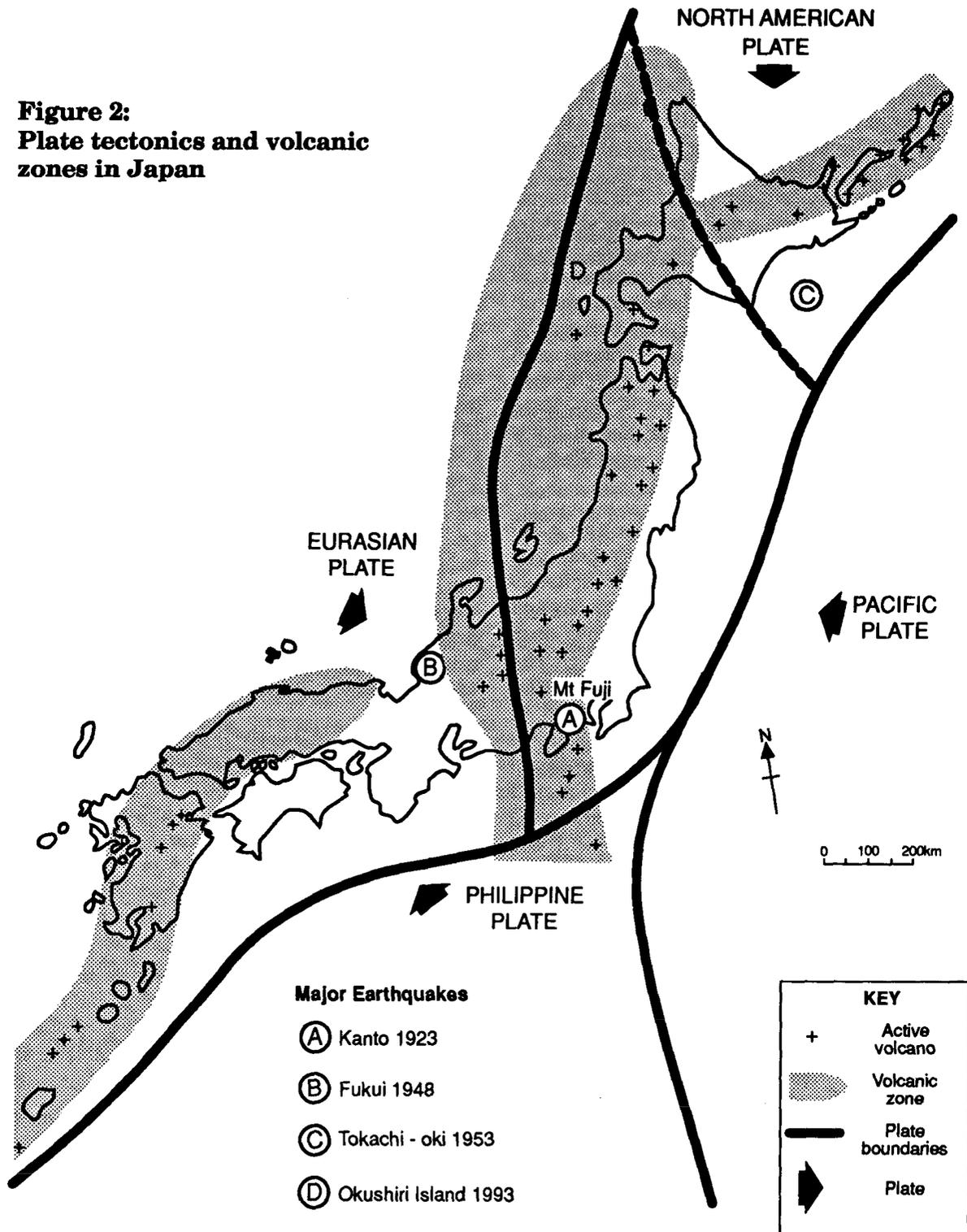
EARLY DEVELOPMENT OF THE ECONOMY

Japan in the pre-Meiji period

According to Andrews (1971) Japan, before the thirteenth century, was a feudal type society with an economy based on agriculture and fishing. Japan was therefore in the first stage of Rostow's model. However, little income was generated from agriculture considering that less than 20% of the land is cultivable, so the Japanese became active traders. This early trade can be traced as far back as the thirteenth century and was dominated by the export of fine steel products such as swords (Japan Festival Education Trust, 1994b). However, export trade came to a halt in 1615. Foreigners were expelled from the country and a great period of isolation followed (De Blij and Muller, 1994).

Kanji (1997) observes that the period of isolation helped not only in the development of a distinct culture and traditions, but also in the development

**Figure 2:
Plate tectonics and volcanic zones in Japan**



of a highly organised system of trade and industry. The country was ruled by military rulers (the *Tokugawa shoguns*) during the period of isolation (1615–1867). Howell (1992) traces the origin of modern industry to this period. According to him, 'the *Tokugawa* economic development fostered an attitude toward work and time management that prepared the Japanese peasantry for the discipline of the factory' (p.270). Smith (1955) also records the tactical introduction of Western techniques and methods in several branches of industry such as ship building, iron and armaments.

Witherick and Carr (1993) argue that the *Tokugawa* period set the pre-conditions for the take-off stage in Rostow's model of economic development. While it is without question that the *Tokugawa* period provided a base for future industrialisation, the economy remained stagnant. It was only after 1868 that real economic growth began.

The Meiji restoration (return of the enlightened rule)

The year 1868 marked the introduction of a new order in Japan. As Robertson (1986, p.94) points out, 'the irruption of the west precipitated the collapse of the *Tokugawa shogunate* and the formation of a new ruling class.' Furthermore, price rises and political unrest brought about by unfavourable treaties undermined the *Tokugawas* (Andrews, 1971). The term 'Meiji restoration' refers to January 1868 when the last Tokugawa shogun 'voluntarily' surrendered power and turned the task of governing back to the imperial family, and specifically to the young Emperor Meiji (Ohkawa and Rosovosky, 1973). The aim of the Meiji government was to increase wealth and military power so that Japan would be able to resist Western colonialism.

It is, however, debatable whether the Meiji restoration constituted a complete social and economic revolution. Feudalism was not completely eradicated. Instead, feudalism was 'selectively and in piecemeal fashion eased out from above, in a manner which brought about changes in the relations of production but not in the essential locus of power' (Halliday, 1975, p.20, cited in Robertson, 1986). Be that as it may, these modernisers must be credited with ushering Japan into a new economic era. The capital was moved from Kyoto to a more coastal location overlooking the sea. The town of Edo was chosen and was renamed Tokyo.

INDUSTRIAL DEVELOPMENT

Foundation for industrial development (1868–1880)

When the modernisers took stock of the nation's resources they found that material assets were limited. Only Hokkaido had substantial amounts of coal while iron ore was lacking and had to be imported. The government thus took the initiative to raise the much needed capital base. The country's agricultural community was heavily taxed, paying as much as 30–40% of their produce (Dempster, 1969). However, the government must be credited for raising farm yields per unit area of land. Research stations were established to produce high yielding seed varieties, which in turn raised farm yields by as much as 80%, while the area under farmland increased by 35% (Dempster, 1969) in order to meet the high taxation levels. This heavy taxation did not enjoy universal approval and there were a number of uprisings against the government and its dictatorial nature. These were all subsequently subdued.

To lay the foundations of industrialisation, the government imported a number of foreign advisers and supported training programs both in Japan and abroad for indigenous people who would ultimately take over from the expatriate manpower. They began the modernisation process building on but not replacing Japanese cultural traditions (De Blij and Muller, 1994). British and German military advisers were called in as initial industrialisation was based on army strength (Dempster, 1969) in line with the government's policy of building a strong military base capable of furthering their imperial dream across the whole of eastern Asia.

Japan may be lacking in natural resources but, as Witherick and Carr (1993) point out, the most important resource in Japan's history has been its people. Confucianism taught that 'if you plan for a year, plant a seed. If for 10 years, plant a tree. If for 100 years, teach the people' (Cowley, 1991, p.16). At the start of the Meiji era in Japan, only 15% of the population were literate (Cowley, 1991) but by the end of Meiji rule (1912) almost all children were attending school. Infrastructure was also developed, including the building of a connecting railway and telegraph line from Tokyo to Kyoto in 1872 (Andrews, 1971).

The government actively encouraged the growth of industry, especially manufacturing industries. Since there was no substantial bourgeoisie class to undertake the development of industry, the state became the dominant proprietor (Robertson, 1986). Smith (1955) argues that this was an extension of the example set by the *Tokugawa* who had also been involved in the development of industry. In this period the cotton and silk industries became dominant, mirroring the example of Britain during her industrial revolution.

The first phase of industrialisation (1880–1931)

The period 1880–1931 was crucial in the development of industry in Japan. Rostow (1960) notes that Japan's take-off can be traced back to the year 1885. Government's initial ownership of enterprises had become a heavy burden hence the model factories were sold to private enterprises (after 1880) as both private capital and experience accumulated (Andrews, 1971). The buyers were members of the *zaibatsu* (big financial cliques) such as Mitsui, Mitsubishi and Sumitomo. These private enterprises worked closely with the government. It must also be noted that the number of foreigners working in Japan dropped significantly during this period, from 527 in 1875 to 155 in 1885 (Macpherson, 1995). This serves to highlight the Japanese government's favouring of local manpower. Macpherson (1995) notes that

foreigners were utilised and dispensed with as soon as possible.

Many heavy (essentially war-related) industries emerged during this period. Industrialisation was boosted by the availability of cheap and plentiful labour resources. Hemadi (1982) notes that the 'workforce bulge' in this period of Japan's history assisted in industrial growth. This partly explains why Japan's early industries were predominantly labour intensive. Whilst industrialisation was proceeding at a fast pace, Japan had neither a secure source of industrial raw materials nor a stable supply of food and the country had to resort to colonialism to attain these. Robertson (1986) notes that Japan went to war on ten different occasions during this period. An important element of these early wars was that the naval ships and the military weapons were all Japanese-made (De Blij and Muller, 1994) reflecting the growing confidence of the Japanese in their own technology and military strength. Korea and Taiwan (then Formosa) became colonies of Japan. Korea's mineral resources were ruthlessly exploited to support Japan's emerging industries. Taiwan had a good agricultural base and thus it became a major supplier of food to Japan whose agricultural base, by then, was insufficient to support the whole country. Hence Japan, through its colonialism, sought to make up for its own resource deficiency.

Japan's economic fortunes were further boosted during the First World War. Industry expanded due to the absence of European products in Asia for the duration of the war (Robertson, 1986). Light industry, in particular, experienced rapid growth in the face of increased demand created by the new Asian markets. Dempster (1969) observes that these Asian markets were retained after the war. Certainly expansion during the 1914–31 period was dramatic, and for the first time the value of industrial production overtook farm production.

A world-wide recession then set in during the 1930s. This resulted in a reduced volume of trade. According to Andrews (1971) the recession provided an excuse for the militarists to invade China with the possibility of securing larger markets and supplies of industrial raw materials like iron ore, coal and cotton. This was later to impact on the character of industry in Japan for by 1935 the country had become a leading global steel producer.

The second phase of industrialisation (1932–1951)

From 1932 to 1945, Japan adopted the ambitious 'guns for butter policy' with the intent of occupying at least eastern, if not all, China, Southeast Asia and possibly Australia (Cole, 1996). This required the maintenance of a formidable war machine. To

support this expansionist policy, the country's industrial base was stretched to the limit. An uncharacteristically large number of women were incorporated into the labour force. Dempster (1969) notes that there was a fall in the dominance of textiles as the metal, engineering and chemical industries grew rapidly. Textiles fell from 59% in 1930 to 38% in 1936 while machinery and metals grew from 16% to 28% over the same time period (Dempster, 1969).

Japan's imperial fortunes, however, ran out in August 1945 when two nuclear bombs were detonated by the United States of America over the cities of Nagasaki and Hiroshima. Japan surrendered and in surrendering the Japanese, suffered what they considered the worst possible fate—a loss of face (Witherick and Carr, 1993). More than 44% of the country's factories were destroyed and national wealth was depleted by 41.5% by the end of the Second World War (Trewartha, 1965).

Japan, faced with the destruction of most of its industry and with severe limitations placed on its rearmament, concentrated its efforts on redeveloping the basis of industrial production (Japan Festival Education Trust, 1994d). The *zaibatsu* were partially dismantled by the government, while the government, some companies and the work-force combined to form Japan Incorporated—a dynamic industrial force of world class.

Two important events were to shape the course of Japan's subsequent industrialisation, namely the escalation of the Cold War and the outbreak of the Korean war in 1951. This resulted in the pouring in of US\$2.5 billion as aid money from the Allied Powers (Robertson, 1986). This was all part of the Western Governments' bid to stop the spread of communism in East Asia. They wanted to establish Japan as a 'bulwark against communism' (Nakamura, 1981, p.35). This aid resulted in the re-development of the coal, iron, petroleum refining and textile industries. The Americans in particular encouraged the growth of private capital. They established revolving funds, for example the Cotton Revolving Fund set up to help re-establish the cotton industry (Nakamura, 1981). Furthermore, the introduction of the seniority and lifetime employment systems helped in maintaining scarce labour resources (Trewartha, 1965). The dual structure—sub-contraction of work to smaller companies—lifted industry to greater heights as the big companies reaped the benefits of cheap labour. This helped by making Japanese goods cheaper and more competitive than those produced overseas. In fact, this duality of industry is a salient feature of industry in Japan even to this

day. The late 1950s, according to Rostow (1960) would mark Japan's drive to maturity (Stage 4).

Industrial character in the third phase of industrialisation (1952–1972)

The Second World War had dealt a severe blow to industry in Japan, but by 1951 production was back to its pre-war time peak, then doubling between 1950 and 1955 and more than tripling between 1955 and 1962 (Table 2).

Table 2: Producers indices in manufacturing (1934–1962)

Year	Index	Year	Index
1934-36	62.5	1955	100.0
1946	16.1	1956	123.5
1947	20.1	1957	146.4
1948	26.9	1958	147.0
1949	35.7	1959	185.2
1950	44.7	1960	236.3
1952	66.8	1961	290.1
1954	92.5	1962	333.1

(Source : Foreign Capital Research Society, 1961) (cited in Trewartha, 1965, p.254)

Industrial production now focused more on providing for the domestic market. This was helped by the fact that foreign goods were largely shunned in preference to those produced locally (Cole, 1996). Furthermore, the state and the banking system relied on the patriotism of the people in saving, participating positively in the companies employing them (Cole, 1996).

Secondary and tertiary industries expanded more rapidly than the primary sector. Palmer (1992) notes that the rapidity with which industrialisation occurred during the 1950s and the early 1960s produced severe labour shortages and also raised labour costs. Rostow (1960) notes that Japan entered the fifth stage, the age of high mass consumption, in the 1950s. He points out that this stage was made possible by the increase in real incomes. This, in turn, impacted on industry as the increase in demand called for greater industrial production.

The fourth phase of industrialisation (1973–1990)

The rapid rate of economic growth since the end of the Second World War was halted abruptly by the 1973 oil crisis and the world economic recession which followed. Since Japan depends on oil imports for most of its energy requirements, the rapid rise

in oil prices had far-reaching consequences. Palmer (1992) notes a retraction of consumer markets in all overseas destinations for Japanese exports as the rise in fuel prices had a knock-on effect in increasing production costs. Growth in the booming ship-building industry was also arrested. Oil prices further escalated in 1978–79, but did not result in a total collapse of the Japanese economy. In fact, as Witherick and Carr (1993) point out, the oil crises only hastened the process of economic adjustment which had been set in train by increasing competition from the other newly industrialising countries (NICs) producing cheaper goods (for example, South Korea and Hong Kong). Large corporations thus began to diversify into the production of consumer durables and information (Palmer, 1992). Diversification to high-technology was aided by the availability of a highly qualified labour force. Thus emphasis

'shifted away from the propulsive industries of the high growth phase requiring high ratios of material and energy inputs towards energy saving activities with low material inputs, but technologically based and with high value added during production' (Witherick and Carr, 1993, p.68).

Micro-electronics, biotechnology and opto-electronic industries became dominant. The related success of the growing tertiary sector is shown by the increasing employment figures in this sector (Table 3).

The revaluation of the Yen against the United States dollar in the 1980s had far-reaching consequences. It made Japanese goods more expensive on the export market. Japanese firms turned to greater exploitation of the domestic market (Palmer, 1992). The shift was made possible by the general affluence of the people which translated itself into a bigger market.

A decline in the value of manufacturing is, however, observable from the mid 1980s. The tertiary sector assumed even greater importance. Palmer (1992) attributes this dominance to the huge trade surplus that Japan enjoys in terms of balance of payments. This brought about an accumulation of foreign currency in Japan, particularly in Tokyo, raising its status as an international financial market. Tokyo's central position—midway between the New York and London financial markets—contributed much to its growth as a financial centre in this globalised world. To date, Tokyo is the world's second largest financial centre after New York. More than 60% of Japan's population is employed in the tertiary sector (Witherick and Carr, 1993). This will put Japan into a possible sixth stage of Rostow's model, the post-industrial society. Witherick and Carr

Table 3: Employment trends in Japan's industries: 1960–1990

	Primary sector GDP	TE (%)	Secondary Sector GDP	TE (%)	Tertiary Sector GDP	TE (%)
1960	12.6	30.2	39.0	28.0	48.4	41.8
1970	5.9	17.5	43.1	35.2	51.0	47.3
1980	3.5	10.6	38.6	34.9	57.9	54.7
1990	2.8	7.2	38.4	33.5	58.8	59.3

TE = total employment

(Source: Witherick and Carr, 1993 p.69)

(1993) have pointed out that Japan entered this phase in the mid 1980s.

Certainly the growth in Japan's economy has been phenomenal and in trying to explain the emergence of this 'miracle economy' Western observers have frequently made the remark that economic growth was generated through export trade. Ohkawa and Rosovsky (1973), however, reject this export led growth hypothesis

'Our position is that Japan's rate of growth of exports has been high and well above world averages because the rate of growth of its economy and especially of its industry has been high and well above world averages and not vice-versa' (p. 173).

It is indeed logical that a country with high economic growth rates may correspondingly have high export levels. Andrews (1971) also noted that Japan exported less of its production than most of the industrialised countries. Table 4 shows that Japan's exports are less than those of the United states and Germany. Waugh (1994) attributes the success of Japan's economy to a large and affluent domestic market.

It has been suggested that the Japanese are copiers who are unable to make their own original products. Any country moving towards industrialisation certainly begins by copying (Andrews,

Table 4: Shares of world trade for selected countries (1989)

	World Exports (%)	World Imports (%)
Japan	9.1	6.7
France	5.9	6.1
UK	5.0	6.3
USA	12.1	15.7
Germany (West)	11.3	8.6

(Source : Witherick and Carr, 1993 p. 178).

Table 5: Research and Development Expenditure (R & D): Some International Comparisons (1989)

	R & D expenditure (US\$ M)	Percentage of national income
Japan	79 053	3.43
USA	142 000	3.36
USSR	61 742	—
W Germany	34 467	3.70
France	22 231	2.68
UK	18 402	3.01

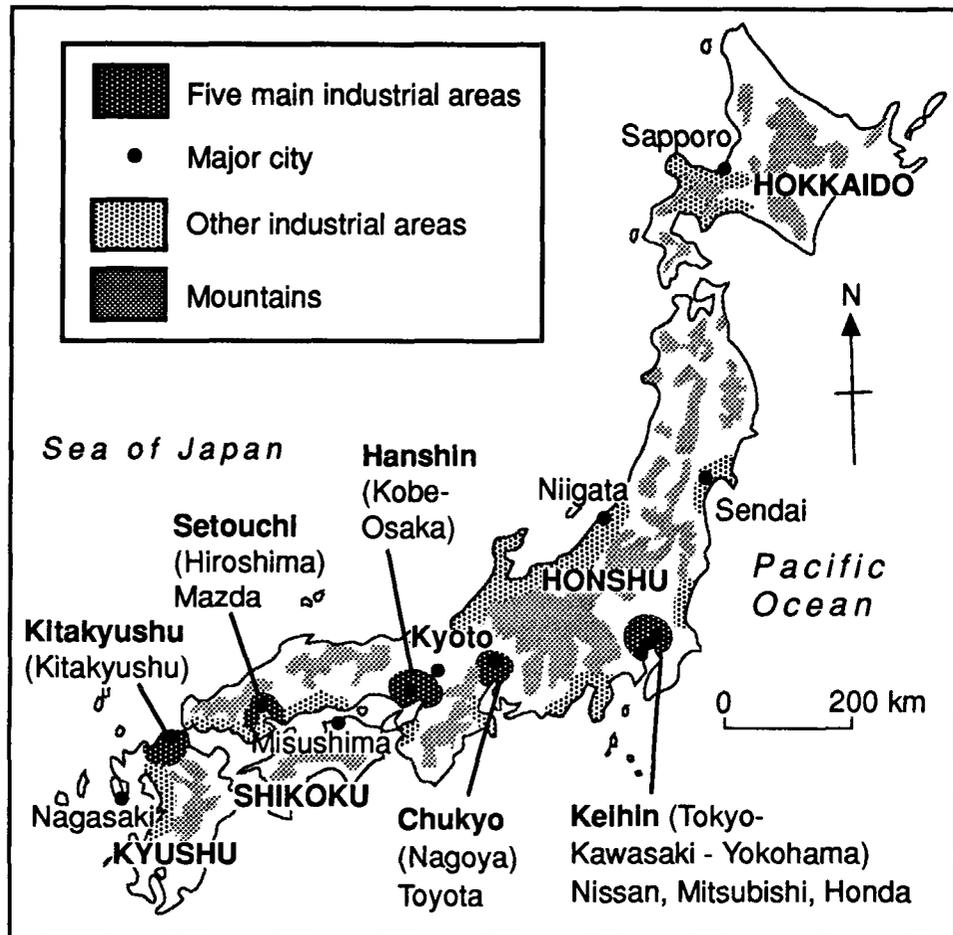
(Source: Witherick and Carr, 1993)

1971). The Japanese certainly copied initially. 'Made in Japan' in the 1950s meant a shoddy imitation of the real thing! Nowadays stringent copyright measures and anti-piracy acts have helped to combat this. Japan has heavily invested in Research and Development and the percentage of income expended on this is comparable with most developed countries (Table 5).

Investment in this field has yielded dividends. De Blij and Muller (1994, p.22) sum it up when they state that 'No city in the world today is without Japanese cars in its streets, few photographic stores lack Japanese cameras and films: laboratories the world over use Japanese optical equipment.' Indeed, Japan is a world leader in industry to date.

THE LOCATION OF MANUFACTURING

Figure 3 shows the general outline of industrial distribution in Japan. Only 17% of the country is flat enough for farming, industry and settlement. The most important industrial location factors are

Figure 3: Locational benefits for industry in Japan

Source: Waugh, 1994, p.120.

thus the distribution of lowland, people, and the availability of sheltered deep-water ports (Waugh, 1994).

Industry is concentrated along the Pacific coastline, mostly on land reclaimed from the sea. Five major industrial concentration centres are: Keihin (centred on Tokyo), Chukyo (centred on Nagoya), Hanshin (centred on Osaka/Kobe), Setouchi (centred on Hiroshima) and Kitakyushu (centred on Kitakyushu). These industrial regions are centred on cities for easy access to markets and labour resources. As De Blij and Muller (1994) point out, Japan has several huge urban centres. The Tokyo-Yokohama-Kawasaki metropolitan area, for instance, has a population of 26.2 million people. The coastal location of these centres serves to highlight the importance of raw material importation. Apart from these five main centres, there are numerous smaller industrialised areas dotted throughout the country.

SELECTED INDUSTRIAL SECTORS

Industry has become extremely diverse in Japan. This section examines the most important

industries, namely the iron and steel, automobile and electronics industries.

The Iron and Steel Industry

Japan is poorly endowed with iron ore and coal resources. Cole (1993) has noted that most of Japan's coal and iron ore resources have been depleted, hence it relies heavily on other countries for these raw materials. Most of the iron ore comes from Australia, USA, Canada and Africa. To offset this raw material handicap, most steel mills are integrated and are located on or near the coast so as to minimise transport costs. Examples include Nippon Steel and NKK, both located in the Pacific Coastal Belt.

Witherick and Carr (1993) give two reasons for the growth of this industry. They note that it is basic to many other Japanese industries such as the shipbuilding and automobile industries. In addition, exports to other countries in the region have also contributed to the growth of this industry in Japan.

Steelmaking grew rapidly in the 1960s but was checked by the 1973 oil crisis and the world recession

which followed (Japan Festival Education Trust, 1994d). The rise in the prices of petrochemicals also hit the industry hard as it relies on imports. However, Japan remains a leading steel producer. The industry has gone through rationalisation with small, uneconomic plants such as Kamaishi closing. Operating costs have been further reduced by the introduction of automation (Keeble, 1990). Steelmaking companies are also diversifying into other activities, for example, Nippon Steel has now expanded into electronics, leisure, information and biotechnology.

However, a new crisis is facing Japan's steel industries. Diminished returns, stemming from rapidly contracting export markets in the current Asian crisis, are seriously threatening companies like Kobe steel and NKK with closure (*The Economist*, 1998a). Competition is also increasing from cheaper steel from the newly industrialising countries, particularly South Korea.

The Automobile Industry

The automobile industry is one of the fastest growing industries in Japan. More than 10% of Japan's workers are involved in this industry either directly or indirectly (Japan Festival Education Trust, 1994f). 11 main companies dominate the industry (Table 6).

Production of vehicles is centred around Nagoya, Tokyo and Hiroshima. Automation has enabled high output per worker, averaging 45 cars in 1980 compared with a figure of 15 for the European countries (Japan Festival Education Trust, 1994f).

In this field, Toyota is the leading vehicle producer.

The automobile industry is currently facing difficulties. The revival of the motor vehicle industry in Europe and the USA, as well as the rise of new producers such as South Korea pose a serious threat (Cole, 1996). The current Asian crisis is certainly taking its toll on some motor vehicle companies. Toyota and Honda remain competitive, but Mitsubishi Motors, Nissan and Mazda are all on their knees (*The Economist*, 1998a).

The Electronics Industry

A high technology (high-tech) industry can be defined as 'those industries in which rapid technological change and high inputs of scientific research, development expenditure and employment are producing new, innovative and technologically advanced products' (Keeble, 1990 p.36). Japan is a world leader in the production of such electronic goods (Table 7).

Over 17% of Japan's workforce is employed in the electronics industry (Japan Festival Education Trust, 1994e). Kyushu is the leading electronics producing region and is comparable to the Silicon Valley in California, USA, hence it is sometimes known as the 'Silicon Island' (Japan Festival Education Trust, 1994e). More than 40% of Japan's electronic industries are located in Kyushu. Witherick and Carr (1993) identify the availability of cheap female labour, cheap land prices and government's incentives as the main locational factors attracting these industries to this island. However, the electronics industry is facing

Table 6: Motor vehicle production in Japan, 1991
(figures in thousands)

Company	Cars	Trucks and buses	Total	% Share
Toyota	3180	905	4085	30.8
Nissan	1946	384	2330	17.8
Mitsubishi	914	491	1405	10.6
Mazda	1085	300	1385	10.5
Honda	1215	143	1358	10.2
Suzuki	513	326	858	6.5
Daihatsu	420	250	670	5.0
Fuji	303	198	501	4.0
Isuzu	130	340	470	3.6
Hino	—	90	90	0.7
Nissan diesel		60	60	0.5

(Source : Japan Festival Education Trust, 1994f p.41).

Table 7: The world's largest semi-conductor manufacturers, 1987.

Name of Company	1987 Rank	1986 Rank	Revenue (US\$ bn)
NC (Japan)	1	1	31 993
Toshiba (Japan)	2	3	2 939
Hitachi (Japan)	3	2	2 781
Motorolla (US)	4	4	2 450
Texas Instruments (USA)	5	5	2 125
Fujitsu (Japan)	6	6	1 899
Philip Signetics (Netherlands)	7	8	1 597
Intel (USA)	8	11	1 500
Mitsubishi (Japan)	9	10	1 481
Matsushita (Japan)	10	9	1 479

(Source: Witherick and Carr, 1993 p. 99).

competition from China, Hong Kong and South Korea (Cole, 1996). Overseas competitors are also now penetrating the Japanese domestic market, especially those from the United States.

HAS THE SUN REACHED ITS NOON?

The sun seems to be setting on Japan's industrial economy. Some observers feel that Japan's economy is already flat on its back and showing few signs of life (*The Economist*, 1998b). Unemployment is rising steadily as companies continue to collapse or decrease their operations. Whether Japan is moving into the sixth stage of Rostow's model as suggested by Whyne-Hammond (1985) is a matter of perception. What is true, however, is that there are severe problems affecting Japan's economy.

Demand for industrial goods has been greatly cut back due to the increase in sales tax in 1997 (*The Economist*, 1998b). There have been calls to scrap these sales tax increases, but to no avail (*The Independent*, 1998a; *The Independent* 1998b; *The Herald*, 1998a). Such a move, it is said, would have the effect of stimulating demand by increasing the spending power of consumers. *The Herald* (1998b) cites the failure by the then President, Mr. Hashimoto, to revamp the economy as having led to his eventual resignation as President in mid-1998.

Hard hit by the current crisis are the banks whose free lending policies resulted in the accumulation of huge debts (*The Economist*, 1998b). Their position has not been helped by the fall in stock prices in early 1998. It remains to be seen whether the 'Big-Bang'—the recent reformation of the financial sector will be a success or not. The

Big-Bang seeks to stabilise the value of the yen with the advent of the Euro (Kazuhito, 1994). It also seeks to liberalise the currency conversion system and will strive to stamp out corruption in the financial sector (*The Independent*, 1998c). Should this be achieved, the Yen may be allowed to compete actively with the Euro, elevating the economy to higher levels (*The Independent*, 1998d).

Japan's ageing population has also had a negative impact on economic growth. The worry centres on the diminished number of young people entering the labour pool and the increasing need for the provision of welfare for the elderly population. It is forecast that 21% of Japan's population will be over 65 years old by 2010 (Cole, 1996). Pension obligations, even today, threaten to topple many firms. On average most companies' assets cover only 60% of their workers' benefits (*The Economist*, 1998a). Pension payments may thus send many firms into liquidation in the near future.

The newly industrialising countries pose a severe threat to Japanese goods. These nations produce cheaper goods because they use cheaper labour. Hence Japan's industries need look for labour saving techniques such as the use of automation so as to reduce labour costs. This would enable Japan to produce cheaper goods on the global market.

Japan's destiny also lies in the hands of mother nature because it lies in an earthquake-prone zone. Should a major earthquake hit Japan its economy would suffer and the effects would be felt worldwide. The Kobe earthquake (17 January 1995) resulted in a 46% fall in the value of exports in January 1995 compared with January 1994 (Japan

Festival Education Trust, 1994b).

Pollution from the country's industries is yet another major problem. Palmer (1992) cites the numerous cases of pollution, the most notorious being the 1959 'Minamata disease' in which thousands of fish died due to organic mercury poisoning. However, Japan has introduced stringent anti-pollution measures with some effect.

The Japanese are widely acclaimed for their work ethic and this has been part of the country's recipe for its "miracle" success. However, this has also introduced new problems. Japanese fathers spend an average of 3.32 hours a day with their family compared with 4.75 hours for the United States fathers (*The Herald*, 1998c) and this reduced parent-child relationship has been blamed for the alarming levels of teenage violence and prostitution. All of which threaten the very social fabric of the society and its economy.

CONCLUSION

Japan's road to economic prosperity has not been an easy one. The Japanese worked hard to achieve their goal of making themselves an affluent society. In this the government played an important role in formulating policies which encouraged growth while manufacturing has previously been important in Japan's economy, it is now increasingly being dominated by the tertiary sector. The case of Japan is good support for the view that a lack of resources need not be a handicap to rapid economic development.

The country typifies a developed country that has gone through Rostow's five stages of economic development while it also follows the sixth stage which has been suggested for those countries whose economy is no longer anchored on manufacturing. It has also been established that growth in Japan, as elsewhere, is concentrated in major centres creating pockets of the 'haves' and 'have-nots'. Growth can never be evenly spread no matter how developed a country is.

Certainly Japan is currently faced with many challenges stemming from the Asian crisis, however, the Japanese are known to have risen successfully from many major disasters before. It remains to be seen whether Japan will once more bounce back from its present economic woes, but only time will tell.

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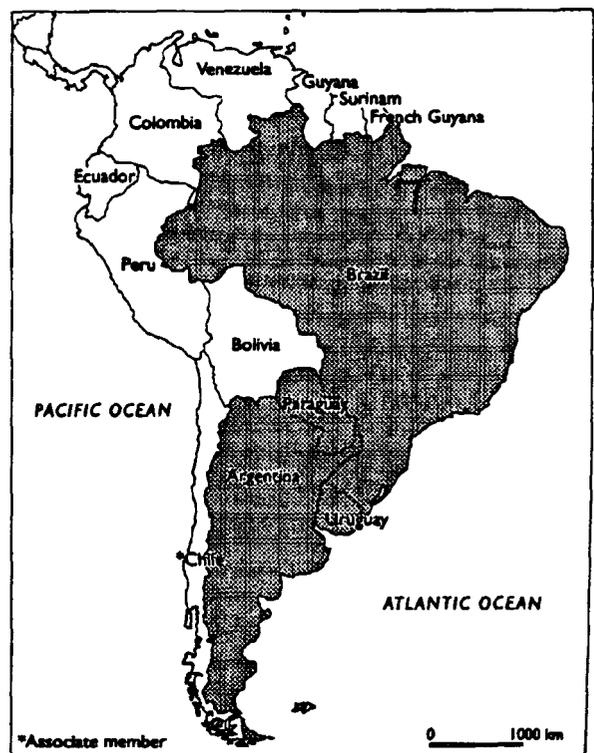
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Economic Associations of the World.
See also pages 10 and 13.
MERCOSUR
Mercado Común del Sur
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