The Uno Newsletter:

Rejuvenating Marxian Economics through Uno Theory

(Vol. II, No. 19)

Working Paper Series 2-19-1

20 March 2017

The rise and fall of Japanese economy in super long waves of capitalist world systems

Nobuharu Yokokawa (Musashi University, Japan)

(yokokawa@.cc.musashi.ac.jp)

http://www.unotheory.org/news_II_19

The Uno Newsletter: Rejuvenating Marxian Economics through Uno Theory

Office: c/o Nobuharu Yokokawa, Uno Newsletter, Musashi University, Toyotama-Kami 1-26-1 Nerima-ku, Tokyo 1768534 Japan

Email: contact@unotheory.org

Homepage： http://www.unotheory.org

The rise and fall of Japanese economy in super long waves of capitalist world systems

Nobuharu Yokokawa (Musashi University)

Introduction

After the financial crisis of 2007–2008 we are facing the beginning of the end of the postwar capitalist world system. Once I called the 1920s an interregnum when the old hegemon Britain lost economic and military power to organize capitalist world system and the potential new hegemon the USA did not have will to create a new capitalist world system. It was a period of discontinuity in social order accompanied by widespread unrest, wars, and power vacuums. It continued three decades before a new capitalist world system was reestablished by the USA. On the other hand, an interregnum is a most important period to create a more stable and egalitarian world system. In this paper, I will follow long and super long waves of the capitalist economy, and examine the rise and fall of the Japanese economy to find the requirements for more stable and egalitarian economic development.

In the first section, long waves and super long waves are examined introducing concepts of dynamic industries and VAL. The dynamic comparative advantage of industries depends on the difference between VAL and wages. Dynamic comparative advantages of dynamic industries do not last forever, because of the eventual decrease of VAL and increases in wages. Long waves are stages of development in a capitalist world system. They are explained by the shift of dynamic industries and corresponding capital accumulation regime (or “techno-economic paradigm” Perez 2003). A capital accumulation regime with new dynamic industries follows formation, development, maturity, and then structural crisis. The structural crisis of a capital accumulation regime is a creative destruction from the viewpoint of new dynamic industries. Super long waves are explained by the shifts of capitalist world systems. The first capitalist world system was created by Britain in the early 19th century. It followed three stages of development: mercantilism, liberalism, and imperialism. They are the stage of formation of the capitalist world system, that of establishment and that of diversification. The stage of diversification (imperialism) was that of the formation of a new capitalist world system, Bureaucratic Capitalism. It was created by the USA, and also followed the stage of establishment (the golden age) and then that of diversification (neoliberalism).

In the second section, I build a new flying geese theory incorporating dynamic comparative advantage theory with Akamatsu’s flying geese theory (Akamatsu 1962). The new flying geese theory enables to analyze both linear (catchup) industrialization and non-linear (uneven) development, vertical specialization, and changes in the leaders of dynamic industries (Yokokawa 2016).

In the third section, I follow Asian flying geese pattern of industrialization and the rise of Japanese economy after World War II (Yokokawa 2013). In the golden age after World War II, Japan shifted its dynamic industry from textile to heavy and chemical industries. The upgrading of Japanese industries left

room for less-developed East Asian countries to industrialize in the flying geese pattern. After the structural crisis of the 1970s, Japan shifted its dynamic industries to machinery industries such as automobiles and electrical machinery, and Asian NIEs shifted their dynamic industries to heavy and chemical industries with export-led growth strategies.

In the fourth section, I examine open product architecture and the fall of the Japanese economy. In the 1980s, The Japanese car industry and other machinery industries improved productivity by introducing integral product architecture. It was very effective, and quality and productivity in automobile and electronic machinery industries improved significantly. Facing declining international competitiveness, US encouraged joint R and D based on consortia of firms to develop industry-wide consensus standard. In the standardized open area implicit knowledge and know how were revealed and became explicit where competition reduced VAL. In the protected closed area that required high technology, existing companies could enjoy high VAL. This inequality of the VAL distribution between open and closed areas led to a drastic change in the division of international labour. In the 1990s US platform leaders successfully encapsulated their core technology with the standardized interface and built-in software. Platform leaders supplied capsulated technology to companies in emerging world, which made assembly makers in developing countries to produce quality products easier and more competitive. Design and production makers in advanced countries are losing competitiveness to the combination of platform leaders and assembly makers in developing countries. It is not Japanese integral product architecture in machinery industries but the combination of closed and open product architecture in ITC and knowledge intensive industries that have become a new dynamic industry.

In the fifth section, I argue that the new dynamic industries enabled China's compressed industrialization, and the China-centric Asian production network replaced the Japan-led Pacific Rim triangle trade regime in the 2000s.

In the conclusion, I speculate the possibility to create a new production-led capital accumulation regime. Information and communication technology with built-in software and the internet has high possibility to increase productivity. I argue that in order to create a new golden age with a production-led accumulation regime solving demand constraint is required. Firstly, Inequality in the distribution of VAL between closed and open areas must be resolved. Secondly, inequality in the distribution of VAL between wages and profits must be reduced. Thirdly, a stable international monetary system such as Keynes' International Clearing Union must be created (Keynes 1980).

1. Long waves of Capitalist economy

Dynamic industries and VAL

In the history of capitalism, clusters of new technological innovations emerged several times. Following Reinert (2003) I use the term "dynamic industries" to denote these revolutionary clusters of new technologies. Perez (2003) summarized evolution of dynamic industries as follows: (1) between the mid-18th and mid-19th centuries, mechanization of the cotton industry, wrought iron, the steam engine, and

railways; (2) between the 1860s and the 1910s, cheap steel, electrical machinery, the internal combustion engine, synthetic dyes, and artificial fertilizers; (3) between the 1920s and the 1960s, mass produced automobiles, cheap oil fuels, petrochemicals, air planes, electricity, and home electrical appliances; and (4) since the 1980s, information revolution, cheap microelectronics, computers, software, telecommunications, computer control instruments, and new materials.

In dynamic industries clusters of innovations accelerate productivity growth, which follows an S shaped logistic curve. Their productivities are measured by VAL. VAL is decomposed to the volume of product and value added per product.

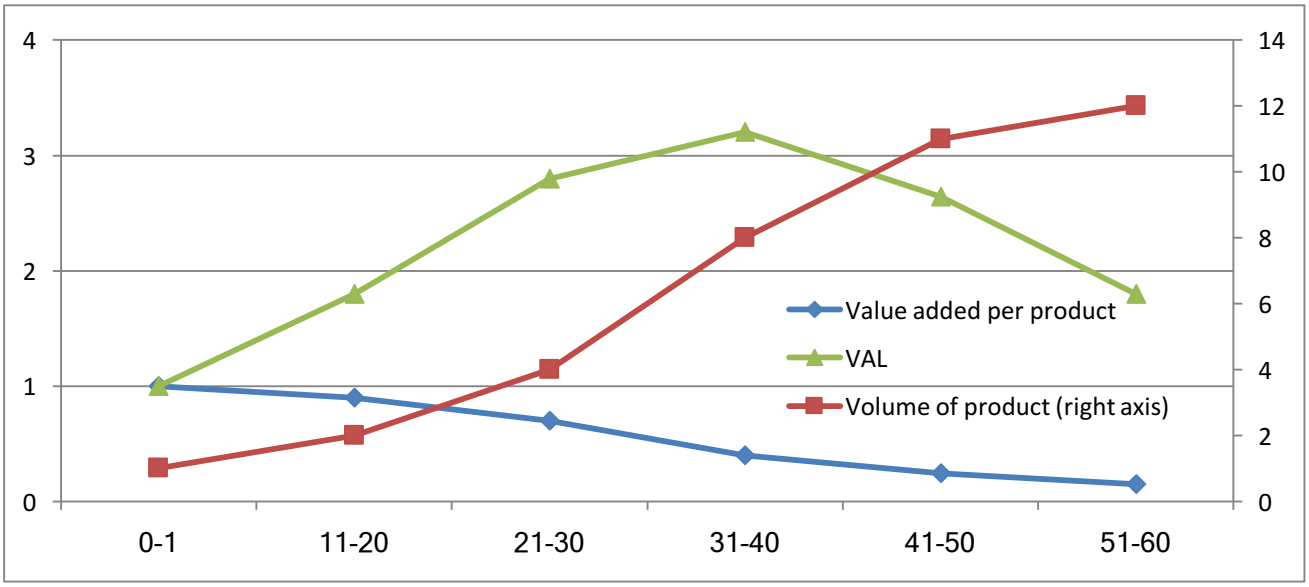
VAL = the volume of product x value-added per product

Dynamic comparative advantage depends on the difference between VAL and wages.

Profits = VAL - Wages

Figure 1 shows that in dynamic industries the volume of the product increases with productivity growth which follows an S shaped logistic curve. The value added per unit of product is large when a new product is exclusively supplied by a limited number of firms. When a new technology spreads, the price of a product becomes cheaper, and value-added per product is reduced. The result is a bell-shaped VAL curve that shows dynamic industry's VAL increases with the increase in productivity and eventually decreases. Historically, real wages increased with average productivity. Then dynamic comparative advantage of a dynamic industry does not last forever, because of the eventual decrease of VAL and increases in wages.

Fig.1 The rise and fall of VAL of a dynamic industry

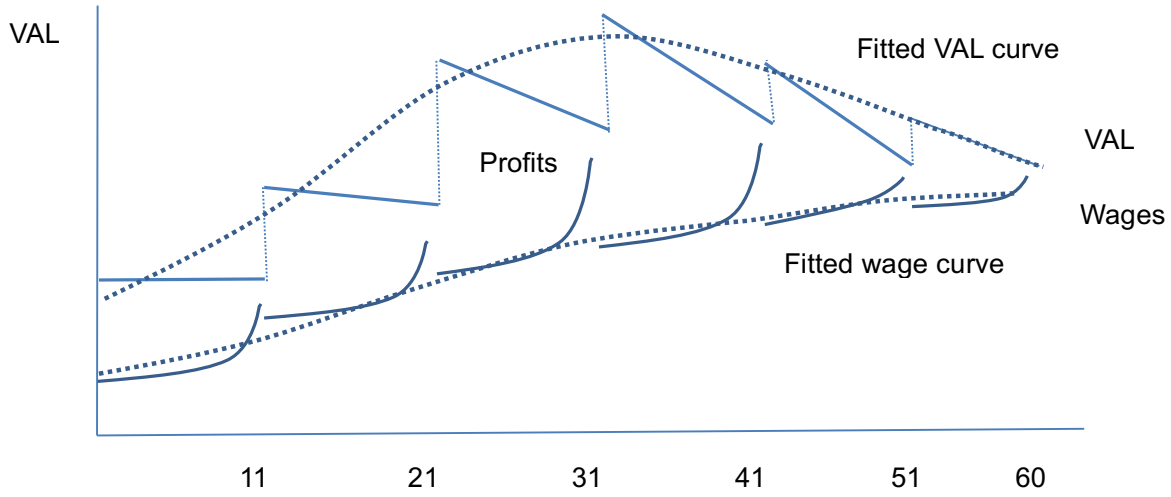


Cyclical crises: dynamic industries and business cycles

Figure 2 shows the relation between capital accumulation and business cycles. When a new capital accumulation regime to accommodate new dynamic industries is created, the new dynamic industries

become the engine of economic growth. When capital accumulation increases in the dynamic industry, capital accumulation in other sectors also increases. The new technology spreads with the progress of prosperity, and the price of the product becomes cheaper reducing VAL. While some types of labour in the dynamic industries become scarce, and wages rise. This reduces the profits and eventually causes a cyclical crisis which spread to other sectors. In dynamic industries, productivity continuously increases by means of the new method of production, which is introduced by replacing old fixed capital with new and more productive fixed capital in a depression. It increases VAL and profits in the dynamic industry. Then the accumulation of capital recommences under sound conditions of exploitation, starting a new business cycle. Through business cycles productivity growth eventually decreases and diffusion of technology eventually decreases prices of products, and their VAL decrease.

Fig. 2 Dynamic industries and business cycles



Long waves: creation, development, and maturity of dynamic industries

Fig. 3 Dynamic industries and long waves

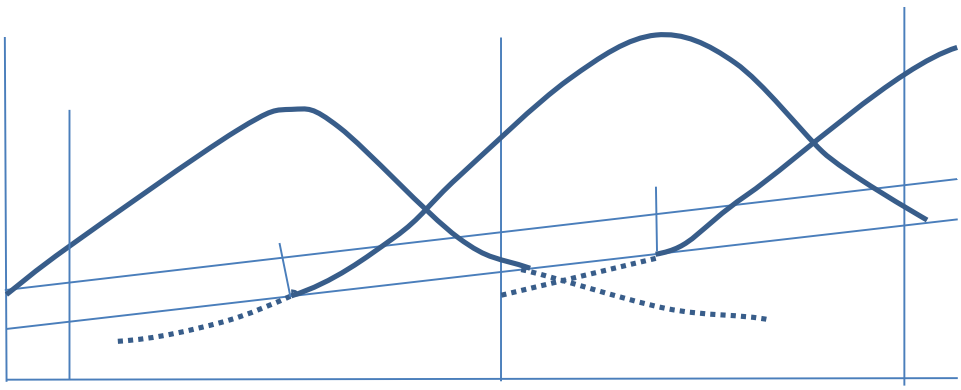


Figure 3 shows long waves of the capitalist economy. It shows that maturity of the old dynamic industry, and big-bang and bubble of the new dynamic industry overlap, and that the structural crisis of the old capital accumulation regime is creative destruction from the viewpoint of a new dynamic industry (Yokokawa 2016).

(1) Maturity and Creation: When old dynamic industries reach their maturity and VAL are reduced, search for new dynamic industries starts. When a new dynamic industry B takes off (Big-bang B), its faster growth of VAL than wages increases its dynamic comparative advantage and profits. Then investment concentrates in this new industry, and often speculation causes a bubble. When the bubble bust the old accumulation regime is destroyed (structural crisis A = creative destruction B). In the turning point B new financial and other institutions are created to accommodate the new dynamic industries B.

(2) Development The new technology becomes the engine of economic growth and creates a new capital accumulation regime. Through business cycles, the expansion of dynamic industries at first increases their VAL since the growth rate of productivity is larger than the decrease rate of the prices of their products. With the diffusion of technology, competition between firms increases, and the reduction of the prices of their products eventually decrease their VAL

(3) Maturity: Reduction of the prices of products of dynamic industries, on the other hand, revitalizes mature industries, either through lower input prices or through the production of relative surplus value with cheaper wage goods. While profits in the dynamic industries decrease average profits increases, and economic growth continues. When the available labour of the industrial reserve army is eventually absorbed with economic growth, wages in lagging sectors have to be increased in order to secure workers. Large wage increases in the dynamic sectors spill over into the lagging sectors, and are mostly passed on to consumers in the form of higher prices. Unlike wage rises in dynamic sectors, they are not compensated by productivity growth.

(5) Structural Crisis: When average wages eventually become higher than the average VAL, production in many industries cannot continue, which causes serious structural crises of the accumulation regime B. If a new dynamic industry C has been created and new financial and other institutions are created to accommodate the new dynamic industry C in the turning point C, a new long wave starts.

2. Super long waves: formation, establishment, and diversification of capitalist world systems

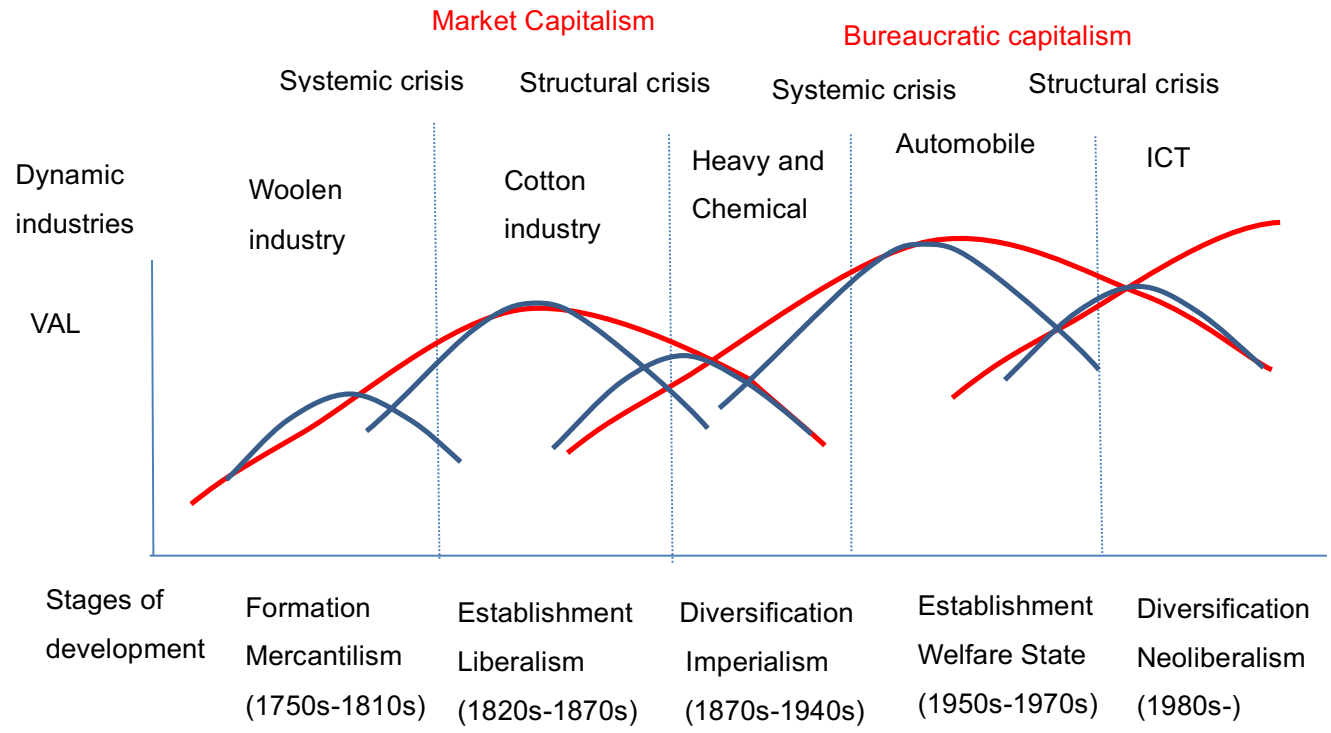
During the evolutionary process of capitalism, numerous varieties of capitalist economies have appeared. While most of them have failed to establish a new world system, the British variety in the nineteenth century, and the US variety in the twentieth century were able to establish respective capitalist world systems with complementary institutions. Figure 4 shows 2 super long waves of the capitalist world systems and 5 long waves of dynamic industries. The capitalist world systems followed formation, establishment and diversification stages.

Market Capitalism: formation, establishment, and diversification

Formation of market capitalism started when Britain started industrialization in the woolen industry following the Low Countries. Mechanization of cotton industries started at the end of the 18 century in Britain. It developed into a new dynamic industry in the early 19 century in Britain. The first capitalist world system, market capitalism was established by Britain since its capital accumulation regime was depended on an international monetary and trade system. Britain imported raw cotton and other raw material and food from all over the world and exported cotton and other manufactured products to all over the world. The dynamic comparative advantages of British cotton and other manufacture industries were fully developed with foreign demand as the engine of demand growth.

After the structural crisis in the late 19th century, the locus of dynamism shifted to heavy and chemical industries, and the centers of economic growth shifted from the UK to the US and Germany (diversification). A new capital accumulation regime, imperialism, was created with two challengers and one old hegemon.

Fig. 4 Long waves and super long waves



The 1920s was an interregnum when the old hegemon Britain lost economic and military power to organize capitalist world system and the potential new hegemon the USA did not have will to create a new capitalist world system. It was a stage of discontinuity in social order accompanied by widespread unrest, wars, and power vacuums. The structural crisis in the US in 1929 took a form of the systemic crisis of finance. It developed into the systemic crisis of the market capitalism in the 1930s. The systemic

crisis of a capitalist world system, such as the great depression in the 1930s is the most serious crisis that abolishes not only the capital accumulation regime but also the current capitalist world system. The interregnum continued for three decades before a new capitalist world system was established by the USA.

Formation of Bureaucratic Capitalism

The stage of diversification and systemic crisis of market capitalism overlapped the formation stage of a new capitalist world system (Fig. 4). There are four characteristics in the diversification stage.

(1) Imperialism was a demand constrained economy. It destroyed the link between productivity growth and export growth which was the engine of demand growth in the liberalism stage for Britain. The dynamic advantage of heavy and chemical industries was not fully developed under imperialism due to demand constraint

(2) “Finance-led economy”. The financial system expanded to encompass longer term capital credit, and investment bankers dominated financial markets. Bankers controlled industrial capital. Minsky (1992, p. 109) wrote “bankers were aware that cut-throat competition was hazardous to the health of their clients . . . They sought to protect the cash flows that the firm they financed generated by forming trusts, cartels and monopolies”.

(3) Globalization. In the latter half of the 19th century, Britain invested more abroad than at home. It accounted for 42% of total international investment before 1914. (Panic 1992, p. 93)

(4) Diversification. After the structural crisis in the late 19th century, the locus of dynamism shifted to heavy and chemical industries, and the centers of economic growth shifted from the UK to the US and Germany.

Establishment: the Golden Age of Capitalism

After World War II, bureaucratic capitalism established the mutually reinforcing mechanism between productivity growth and economic growth, resulting in the long-lasting prosperity of the 1950s-1960s with occasional recessions.

(1) International monetary system. The Bretton Woods system was designed to decrease the external constraint that the gold exchange standard imposed on national economies by creating an international lender of last resort. The US dollar, fixed at the rate of 35 dollars per gold ounce, was chosen as the key currency. All member countries were obliged to fix their exchange rate to the dollar. International balances of payments were to be settled by multilateral payment systems of private banks and central banks. It was the commitment of the USA as the hegemon of the capitalist world system that sustained the Bretton Wood regime, offering international means of payment by the public capital export such as Marshall Plan (Panic, 1988, p. 280).

(2) International Trade. The smooth expansion of international trade under the free and multilateral trade

regime (GATT) and the abundant availability of international currency accelerated the growth of international trade, which in turn accelerated capitalist countries' catching-up and GDP growth.

(3) Big government and the welfare state. The experience of the Great Depression and the war economy established large, well-organised bureaucratic governments, and created a managed currency system in advanced capitalist countries. This experience proved that full employment and stable price levels are achievable with government intervention within a broadly capitalist regime. In the new managed currency system, the central banks could create currency to meet the liquidity needs of the expanding domestic economy. To avoid bank crises, monetary institutions were strengthened by such regulations as central bank controls, close supervision of banks, and the separation of commercial and investment banking, and by such remedies as account insurance and lender-of-last-resort policy.

Welfare state policy was the result of the requirements of oligopolistic firms and states. First, many advanced countries had lost colonies. Oligopolistic firms could not rely upon foreign demand and domestic demand had to replace it. Second, the success of socialist planned economies undermined the superiority of capitalist ones. The bureaucratic government had to achieve full employment and higher living standards. The welfare state policy was constructed by means of two principal policies. First, Keynesian macro policy addressed the absolute gain of national wealth such as GDP growth and price stability. Bureaucratic governments had powerful institutions with which to achieve these ends, such as fiscal and monetary policy, and the sheer size of government stabilized economic fluctuations. Second, social policy addressed the relative gains among the different classes of the state.

(4) Dynamic Industry. The mass production system of consumer durable known as 'Fordism' was established by the early 1950s in the USA, which was introduced in the 1950s and 1960s in Europe. In Japan, the dynamic industries shifted from light industries to heavy and chemical industries in the 1950s and 1960s, and then to the machinery and electronics industries in the 1970s. All countries especially catching up countries benefited from increasing VAL.

(5) Production-led economy (Managerial capitalism). Minsky (1992) gives three causes for the reestablishment of a production-led economy. Firstly, government intervention in the market reduced the bankers' role. Secondly, investment was mainly financed by an internal reserve. Thirdly, management control was established which reduced the power of shareholders.

(6) Industrial Relations. Experience in the Great Depression and the war economy gave strong influence to post-war capital-labour accords. In order to win the total war, capital had to compromise with workers, and capital-labour accords were established during World War II. After World War II, labour unions eventually accepted the introduction of more productive methods in exchange for relatively long and secure employment contracts with productivity-indexed money wages.

The dynamic comparative advantage of the mass production system was fully developed in this production-led capital accumulation regime with wages as the engine of demand growth. This created the second golden age of capitalism. In this production-led capital accumulation regime wages increased

in proportion to increase of productivity, which enabled for demand to grow in proportion to supply[1].

Maturity and Structural Crisis

The long-lasting high rate capital accumulation in advanced countries itself made further accumulation difficult in the 1970s. It eventually reduced productivity growth in dynamic industries. First, "Fordism" reached the saturation stage in many advanced countries by the early 1970s. In Europe, the scope for a catchup with US productivity levels had declined. Second, part of the productivity slowdown stemmed from slower output growth in industries characterized by economies of scale reflecting instability of economies (Glyn 2006). Third, the relative backwardness of productivity growth in the service sector forced de-industrialization (Rowthorn and Wells, 1987). Productivity growth in the service sector was difficult with available technology. On the other hand, diffusion of technology increased competition both domestically and internationally, and reduced the price of products and value-added. As the result, VAL of dynamic industries was reduced.

Long-lasting capital accumulation eventually exhausted the available industrial reserve army in advanced countries. With the over-accumulation of capital relative to available labour, labour unions became militant, and wage bargaining changed from Keynesian with sticky money wages to Marxist with sticky real wages. Large wage increases in the dynamic sectors spilled over into the lagging sectors and were mostly passed on to consumers in the form of higher prices, which further increased wages under Marxist wage bargaining with sticky real wages.

Increases in wages under a declining VAL reduced the dynamic comparative advantage. When demand for higher real wages surpassed limping VAL growth, wage pressure contributed to a squeeze on profitability. The USA and Europe suffered from a structural crisis of the mass production system in the 1970s.

Neoliberalism: Diversification of Bureaucratic capitalism

After the structural crisis of the 1970s, the Anglo-American neoliberal accumulation regime reshaped the capitalist world system. Neoliberalism shares the four characteristics with Imperialism.

(1) Demand constraints: Neoliberalism destroyed the link between wages and productivity growth. Wages were the engine of demand growth in the Golden Age.

(2) Finance-led economy: neoliberal financial relaxation was introduced to solve demand constraints in advanced countries. It includes regulatory capture such as Wall Street's lobbying efforts to decrease regulations, regulatory relapse such as memory loss regarding the lessons of the great depression, and regulatory escape such as the shadow banking system, derivatives, options, home equity loans, and

[1] Ghosh noted that "without generating synergies that rely on the interaction between domestic production and consumption, it is impossible to have virtuous cycles of expansion that also allow for continuous productivity increases." (Ghosh 2016, p. 296)

securitization and tranching of securities (Palley, 2010). Minsky (1992) emphasized the parasitic character of the new finance-led economy: “unlike the earlier epoch of finance capitalism, the emphasis was not upon the capitalist development of the economy but rather upon the quick return of the speculator, upon trading profits”.

(3) Globalization: Advanced countries transferred industries which had lost their dynamic comparative advantage to countries with low wages. Capital flows increased significantly, and the neo-liberal international monetary regime made economies extremely vulnerable to short-term capital flows both in the advanced and developing economies as in the 1920s.

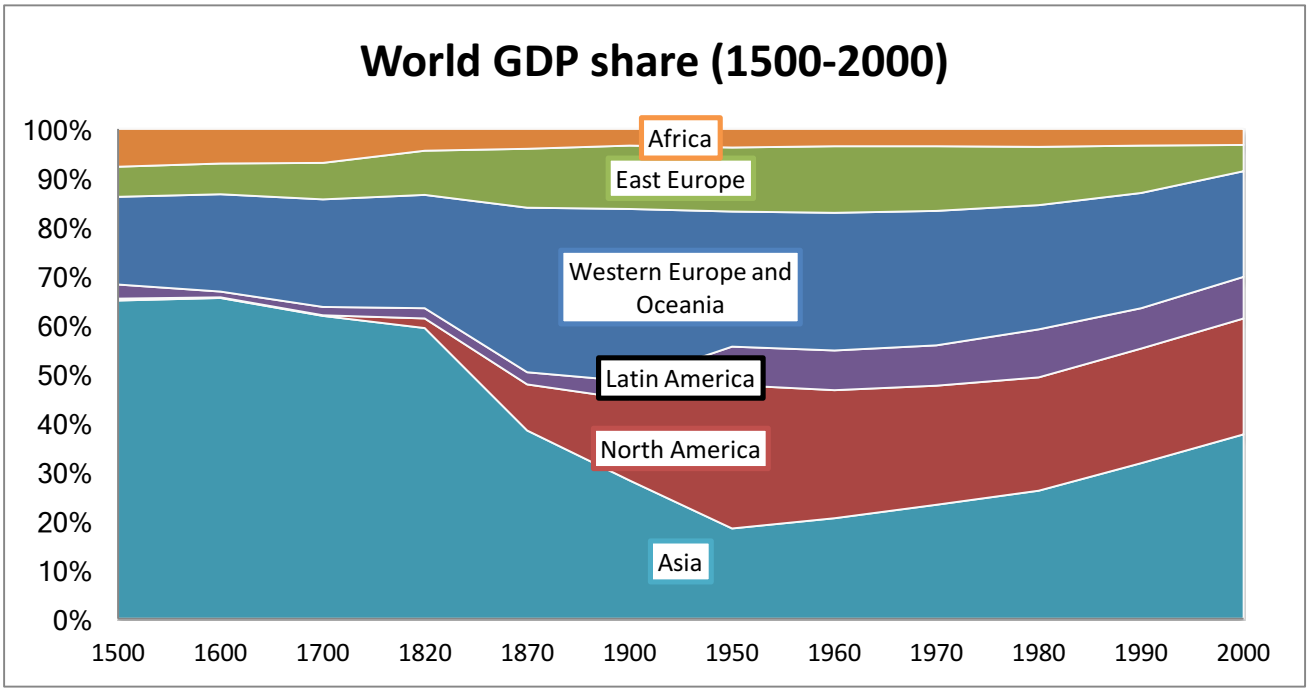
(4) Diversification: The center of economic growth shifted from the USA and Europe to Asia.

2. Reemergence of Asia and the new flying geese theory and

Reemergence of Asia

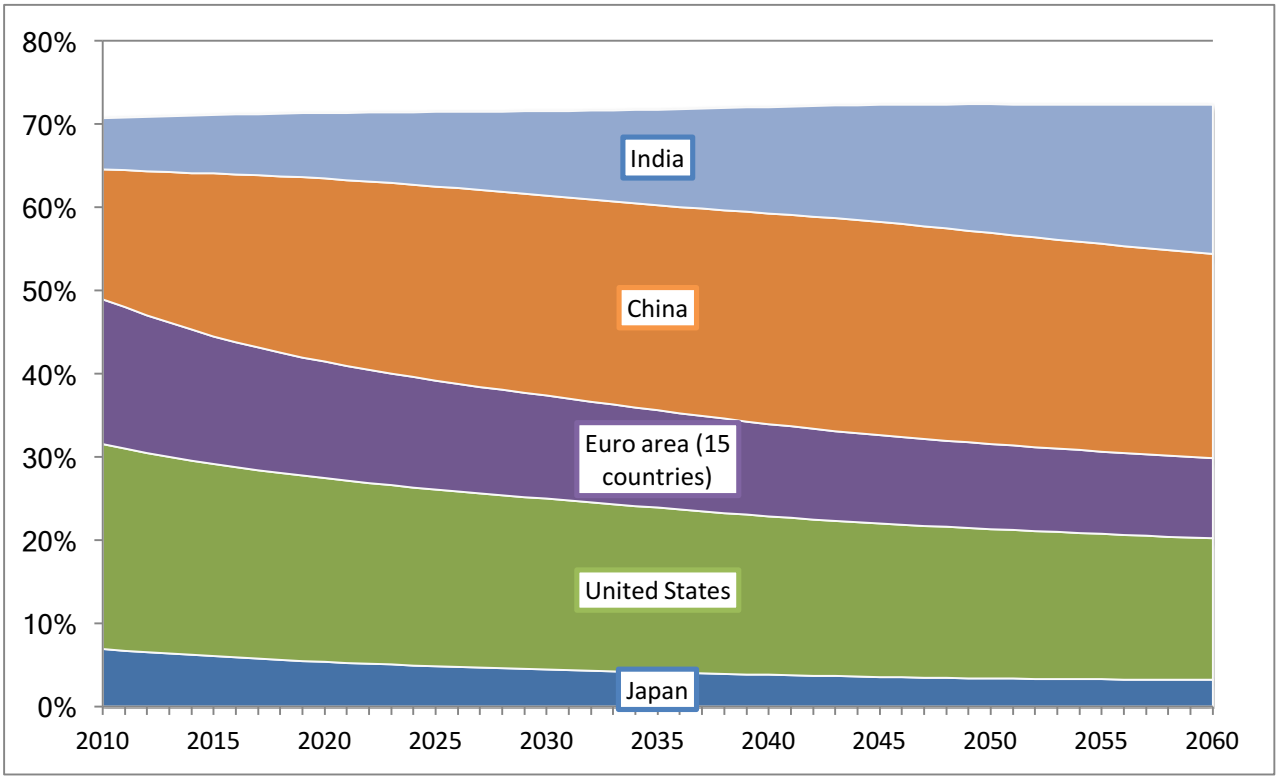
Figure 5 shows that Asia’s share of the world GDP was 60% in 1820. It dropped significantly in Market capitalism (15% in 1950). Only Japan successfully industrialized in the diversification stage of Market Capitalism. Asia’s Reemergence started in the Golden Age of Bureaucratic capitalism and accelerated in its diversification stage (35% in 2014).It may return to 60% in the latter half of this century at the cost of Europe and the North America (Fig. 6).

Fig. 5 World GDP share PPP (1500-2001)



Source: Maddison 2007

Fig. 6 World GDP share at 2005 PPP (2010-2060)



Source: OECD (2014)

Japanese GDP share among selected Asian countries[2] was 37.3% in 1991, then decreased to 11.5% in 2014 (Fig. 7), and in the world 8.8% and 4.4% respectively (IMF WEO 2016). Chinese share was 18.7% in 1991, then increase to 47% in 2014 (Fig. 7), and in the world 4.4% and 16.6% respectively (IMF WEO 2016). Japanese economic growth peaked in the early 1990s, and the center of economic growth in Asia shifted to China and India in the 2000s. OECD (2014) "Long-term baseline projections" projected by the latter half of this century Japanese world share will be 3.2% while Chinese share 24.6% (Fig. 6). Rowthorn (2016, p. 199) commented "It is interesting how small the projected shares of Japan, Indonesia (3.8%) and the two BRIC countries, Brazil (2.8%) and Russia (2.4%) are. . . . The major players will be China, India (17.9%), the USA (17.0%), and the Euro-area (9.6%)" (parentheses are GDP share in 2060 added by Yokokawa).

[2] Most of longer term GDP data use PPP exchange rates which are based on prices of a basket of average consumption goods. They greatly overstate incomes in poorer countries with low average wages. Compare Fig 7 and Fig 8.

Fig. 7 GDP shares of selected Asian countries PPP (1980-2014)

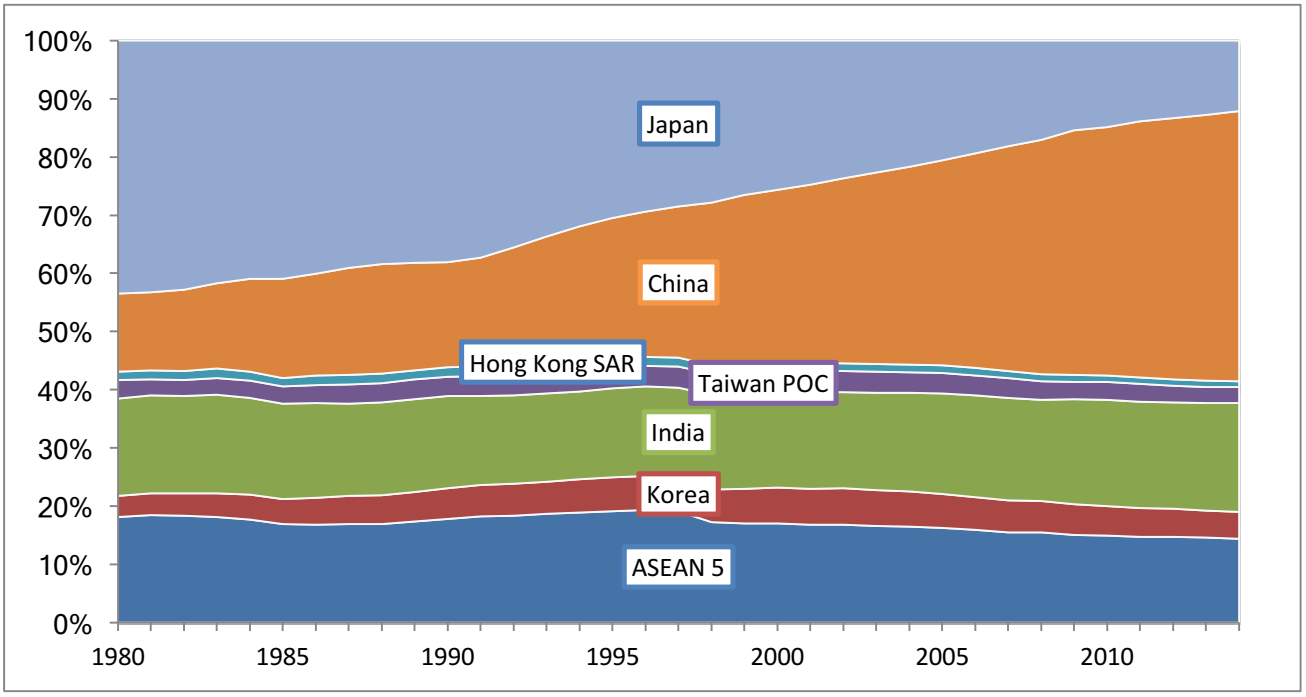
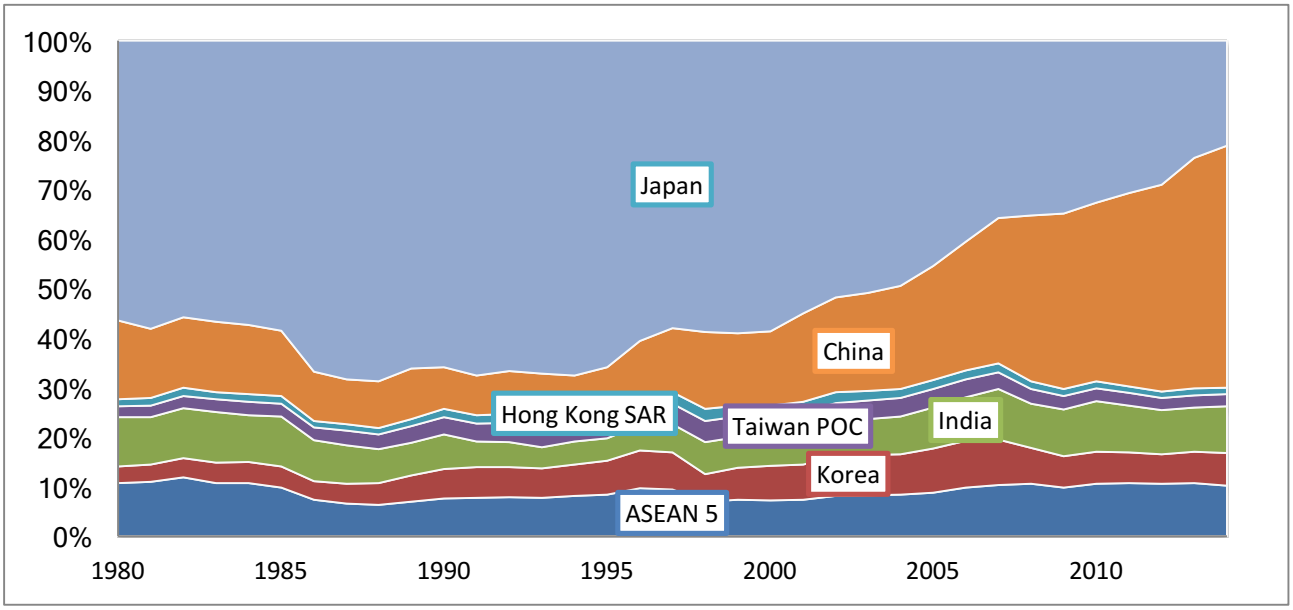


Fig. 8 GDP shares of selected Asian Countries in current US$ (1980-2014)



Source: IMF WEO

Akamatsu's flying geese theory

Industrialization in East Asia has been studied in the framework of Akamatsu's flying geese theory (Akamatsu 1962), which is a proto-dynamic comparative advantage theory and the most original framework for the analysis of East Asian industrialization (Yokokawa 2013). The theory of dynamic comparative advantage complements Akamatsu's flying geese theory and creates a new flying geese

theory (Yokokawa 2016).

The first flying geese pattern is that importation, domestic production, and exportation trace inverted V-shapes, one after another in the flying pattern of migrating geese. (1) A new product is imported from advanced countries. (2) “Previously imported goods” are domestically produced. (3) “The domestic industry develops into the export industry”. (4) With the increase in wages and falling prices of the product due to international competition, the dynamic comparative advantage is reduced, and production declines. In the original theory, the flying geese theory is an import substitution theory.

The second pattern is “development from crude goods to elaborate goods” (ibid.), i.e. the shift to more sophisticated products or industries. Akamatsu emphasized a linear development path and argued that latecomers should imitate the path taken by industrialized countries, and shift specialisation towards more capital-and skill-intensive industries when they lost existing dynamic comparative advantages, such as cheap labour.[3]

The third pattern is the “development of advanced and less-advanced countries in a wild-geese-flying pattern” (ibid). With the progress of Japanese industrialization, the Japanese dynamic industries shifted continuously, and this gave room for the Asian NIEs to industrialise. The Asian NIES followed suit so that their industrialization also took the form of the flying geese patterns. Thus, production and the trade structure in East Asia formed a well-ordered vertical production and trade pattern, or a flying geese pattern starting with Japanese geese, and followed by NIES geese and then ASEAN4 geese.

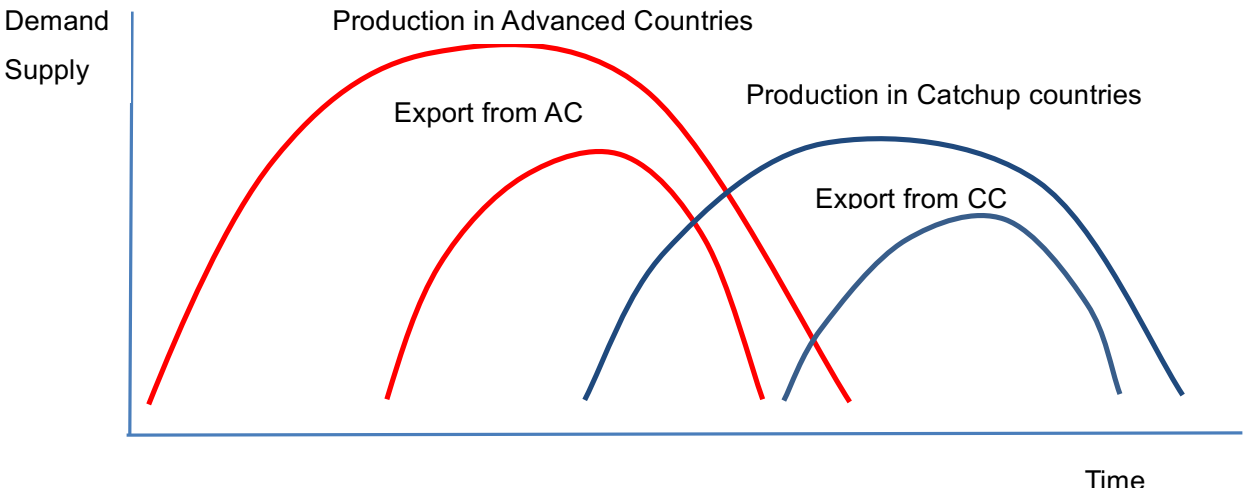
The new flying geese theory

The first thesis

The new flying geese theory examines capitalist development from the point of view of the most advanced country as in the case of Vernon’s product cycle theory (Vernon 1966). Figure 9 shows the flying geese pattern 1A in the established stage of a capitalist world system.

[3] It may be noted here that for advanced economies, a reduction in VAL is a more important cause of the reduction of dynamic comparative advantage than increases in wages. For catching-up economies which import ready-made technologies, increases in wages are the main reason behind decreasing dynamic comparative advantage.

Fig. 9 Flying geese pattern 1A



(1) A dynamic industry is first developed in advanced countries. Demand for its products develops in advanced countries.

(2) As the dynamic industry develops in advanced countries VAL increases. Production expands to achieve economies of scale, and exports begin.

(3) With the further spread of production, the VAL falls. Decreasing dynamic comparative advantage forces reductions in domestic production, and production moves to less-developed countries with lower wages.

(4) Finally, the foreign-produced commodity is imported.

Fig. 10 Flying geese pattern 1B

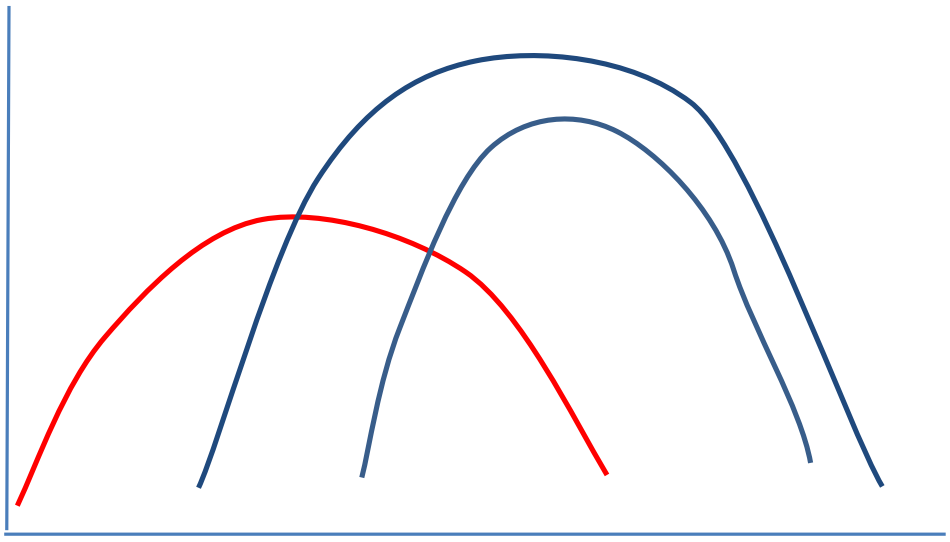


Figure 10 shows the flying geese pattern 1B in the diversification stage of a capitalist world system. In the new theory, flying geese pattern 1 is expanded to explain intermediate goods trade and vertical specialization. It shows reduced deployment in advanced countries and a forwarded catchup in developing countries.

(1) A dynamic industry is first developed in advanced countries. Demand for its products develops in advanced countries.

(2) If a new capital accumulation regime to accommodate the dynamic industries are not created, demand for the product do not increase in proportion to increase of productivity. VAL of the new dynamic industries falls prematury.

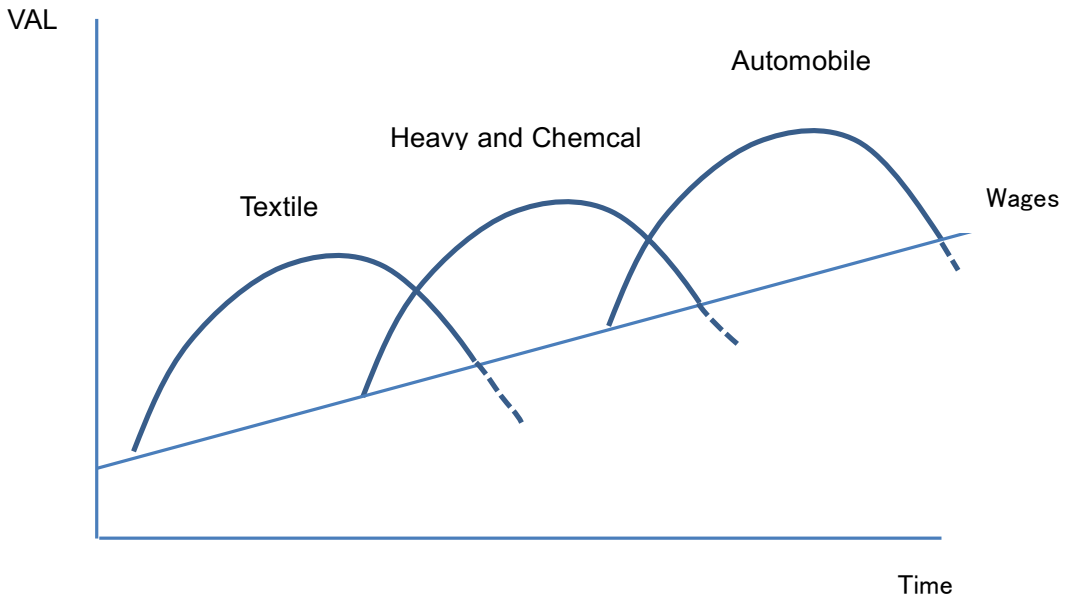
(3) The decreasing dynamic comparative advantage in advanced countries forces reductions in domestic production, and production moves to less-developed countries with lower wages.

(4) If a new accumulation regime to accommodate the new dynamic industries are created in developing countries, production expands to achieve economies of scale, and exports begin.

The second thesis

Figure 11 shows that dynamic industries shift to more sophisticated products or industries when existing dynamic comparative advantages are lost. In the new theory with intermidiate goods trade and vertical specialization, simultaneous industrialization of different levels of sophistication is possible.

Fig. 11 Flying geese pattern II

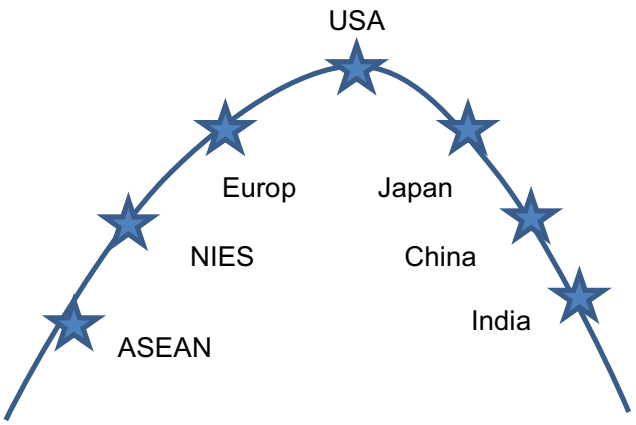


The third thesis

Figure 12 shows “Development of advanced and less-advanced countries in a wild-geese-flying pattern”

(Akamatsu 1962). In its original form, the flying geese theory does not cover uneven development (Akamatsu 1962). In the new flying geese theory changes in the leaders of dynamic industries such as from Britain to the USA and Germany at the end of the 19th century, are explained by the uneven development and the strategies adopted by the countries when they face structural crises in a capital accumulation regime (Yokokawa 2013). Flying geese pattern of industrialization is more efficient if the top goose changes time to time to share the high pressure to the top goose. Intermediate goods trade and vertical specialization make leapfrogging also possible.

Fig. 12 Flying geese pattern III



The new flying geese theory is adaptable to many types of economic development. 3 patterns of industrialization may be identified: (1) flying geese pattern industrialization such as the East Asia; (2) premature de-industrialization as in some countries of Latin America; and (3) service driven growth path such as India. We will show that both second and third cases must be changed to the first case to achieve the genuine structural change. (Rowthorn 2013, Ghosh 2016)

Conversion of VAL by catchup industrialization

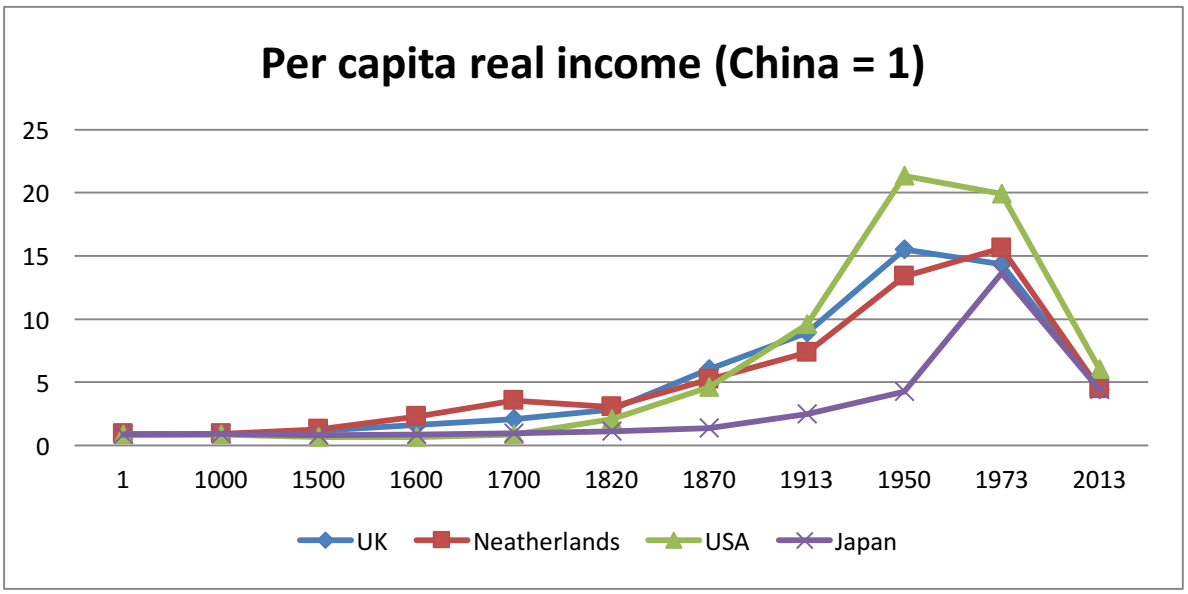
Figure 13 shows that reemergence of Asia has started reconversion of VAL among advanced and developing countries. It is difficult to obtain historical data of VAL of dynamic industries. Maddison's estimate of per capita real income is the best available data as an indicator of average VAL. Figure 13 shows as follows:

(1) There was no disparity in average VAL between Europe and Asia until 1500 due to the Malthusian trap where productivity growth increased the population. Industrialization in Europe started VAL disparity. European countries became rich because they specialized in dynamic industries where technological change was being focused. Asian countries became poor because they specialized in mature industries.

(2) The center of dynamic industries shifted from Netherlands (wool industry) to the UK (cotton industry), then to the USA (heavy and chemical industries then mass produced machinery). The disparity of VAL increased in the period of development of the new dynamic industries, and it was reduced in the period of its maturity.

(3) Industrialization increased the disparity of VAL at first, and among advanced countries conversion of VAL is nearly completed. Disparities of VAL among advanced countries were less than 2 times and it was reduced significantly by 1973. The conversion was nearly completed in 2014.
(4) The disparity of VAL between Japan and advance countries was 5 times in 1950. Catchup industrialization in the 1950s and 60s reduced it to less than 1.5 times in 1973.
(5) For developing countries, it is necessary to industrialize to reduce the widened VAL gap. Chinese VAL gap was 20times in 1980. It is reduced to 3 to 4 times in 2014 thanks to catchup industrialization.

Fig. 13 International disparity of VAL (Chinese per capita real income = 1)



Source: Maddison (2007) until 1998, then IMF WEO (2014)

In order to find the relation between catchup industrialization and conversion of VAL, it is useful to decompose growth of per capita income into three factors following Aoki (2011). (1) demographic factors such as increases in working age population and labour participation rate. (2) structural change such as increasing employment in secondary and tertiary sectors reducing that in the primary sector. (3) increasing VAL in secondary and tertiary sectors[4]. Table 1 shows the following:

[4] Decomposition is made as follows:

$$y = \frac{Y}{N} = \left(\frac{E}{N}\right)\left[\left(\frac{E_A}{E}\right)\left(\frac{Y_A}{E_A}\right) + \left(\frac{E_I}{E}\right)\left(\frac{Y_I}{E_I}\right)\right] = \left(\frac{E}{N}\right)(1-\alpha\beta)\left(\frac{Y_I}{E_I}\right)$$

where Y=GDP, N=population, E=total employment, Y_A=output in primary sector, Y_I = output in secondary and tertiary sectors, E_A=employment in primary sector, E_I = employment in secondary and tertiary sectors. α is the employment share of primary sector ($\alpha = \frac{E_A}{E}$). β is productivity differential between primary and other sectors ($\beta = 1 - \left(\frac{Y_A}{E_A}\right)\left(\frac{E_I}{Y_I}\right)$). Let $(1-\alpha\beta) = S$, which means impacts of structural effects.

(1) Contributions by demographic factors are quite large in the beginning of industrialization (population bonus). Once industrialization is completed this factor becomes smaller or even negative.

(2) Contribution by the structural change can be quite large in the beginning of industrialization since employment in the secondary and tertiary sectors increases shifting employment from primary sector to more productive secondary and tertiary sectors. Once industrialization is completed it becomes minimal.
(3) The increase of VAL in secondary and tertiary sectors is the main source of growth once industrialization is completed. In the catchup period, it is exceptionally large because of the gains to be had from emulating the dynamic industries of the advanced countries.

Table 1 Contributions of demographic factors (D), structural change(S), and VAL

	Japan			Korea			China		
	D	S	VAL	D	S	VAL	D	S	VAL
1950s	**1.43**	**2.34**	**2.54**						
1960s	0.091	0.98	**6.24**				0.76	0.58	0.77
1970s	-0.41	0.62	**3.59**	**2.22**	**2.29**	**3.29**	0.28	**1.65**	0.28
1980s	0.23	0.40	**3.18**	**1.60**	**2.27**	**4.74**	**1.44**	**3.47**	**3.21**
1990s	0.10	0.28	0.53	0.51	0.11	**4.86**	0.03	1.07	**8.39**
2000s	-0.34	0.10	**1.93**	1.22	0.11	**3.28**	0.30	1.60	**7.41**

Source: derived from Aoki 2011, however, periodization is approximate

These results show that genuine structural transformation of an economy requires industrialization and that this remains a necessary stage that cannot simply be bypassed.

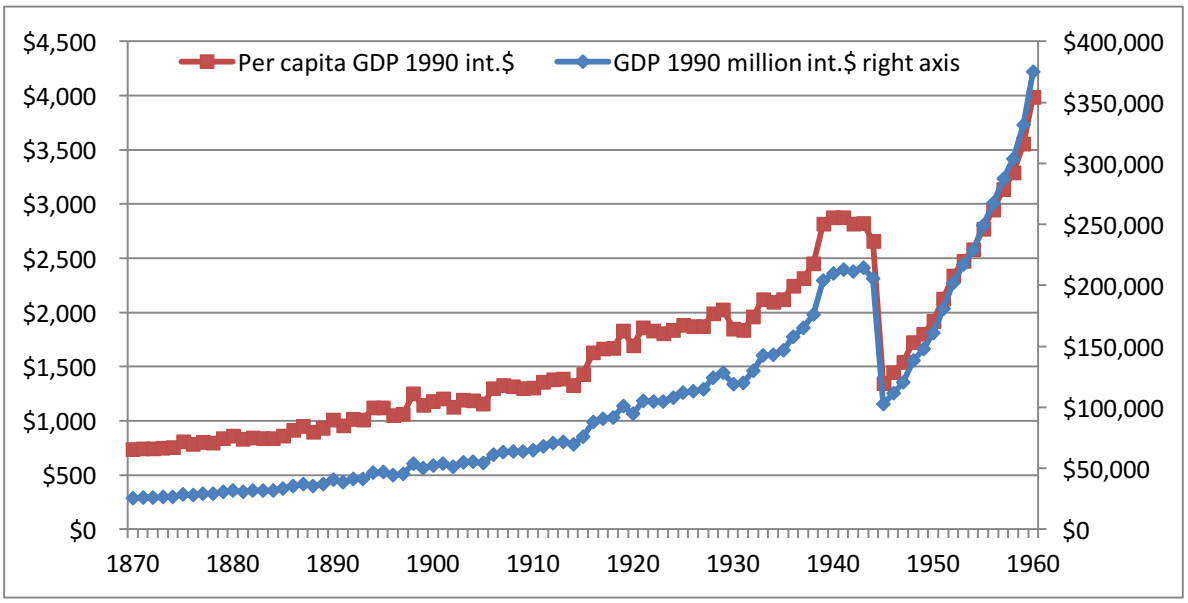
3. Asian flying geese pattern industrialization in the Golden Age

Japanese flying gees Pattern industrialization

Japanese GDP dropped half from 1940 (210 billion US dollar) to 1950 (161 billion US dollar) because of the distraction by World War II (Fig. 14). Employment share in the secondary sector also dropped from 26% in 1940 to 22% in 1950, increasing that of the primary sector from 44% to 49% respectively (Fig. 15). Reindustrialization started in the 1950s. Contributions to per capita GDP growth by demographic factors are quite large in the 1950s (1.43%). Contribution by the structural change is quite large in the 1950s (2.34%) and 60s (0.98%) shifting employment from primary sector to more productive secondary and tertiary sectors (Table 1).

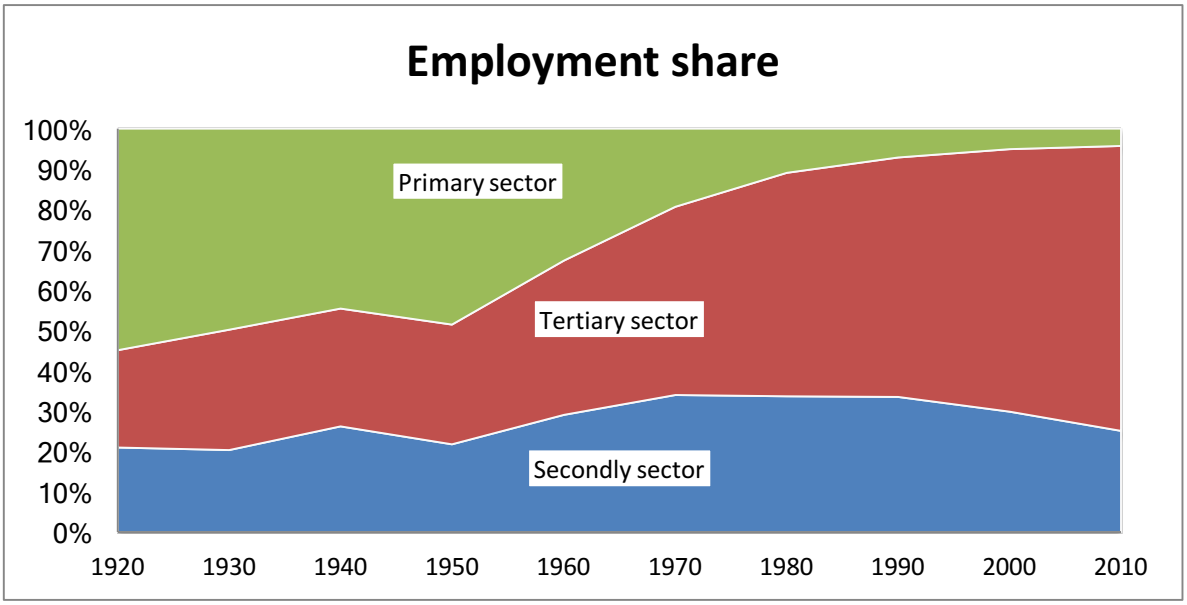
The rate of growth of GDP per capita is decomposed as follows. $\Delta y = \Delta\left(\frac{E}{N}\right) + \Delta S + \Delta(\frac{Y_I}{E_I})$

Fig.14 Japanese GDP (1870-1960)



Source: Maddison 2007

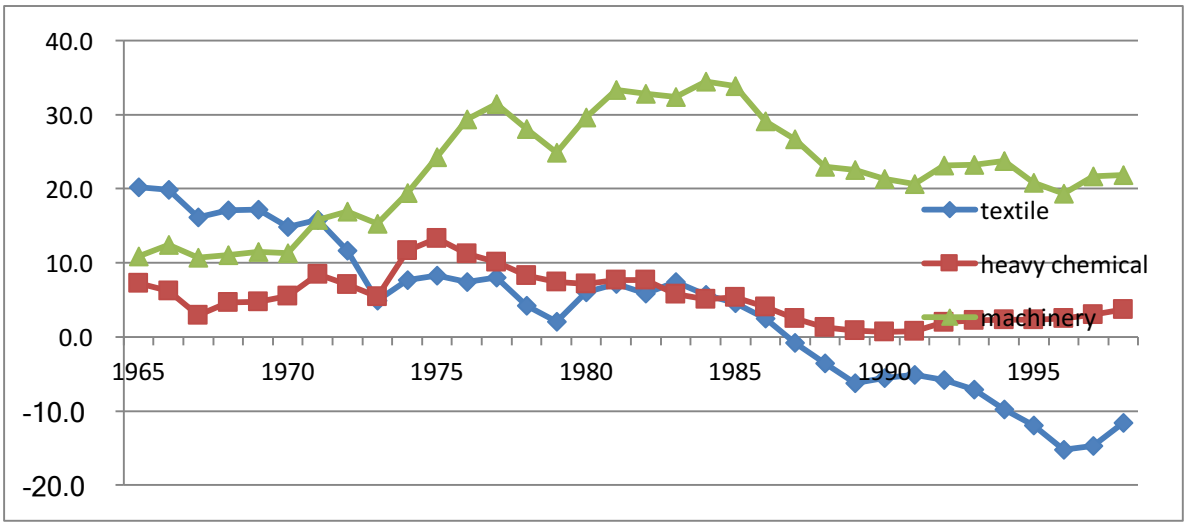
Fig. 15 Japanese employment share (1920-2010)



Source: Nihon Kokusei Zue 2013.

Fig. 16 Flying geese pattern II: Export competitiveness of Japanese industries (1965-1998)

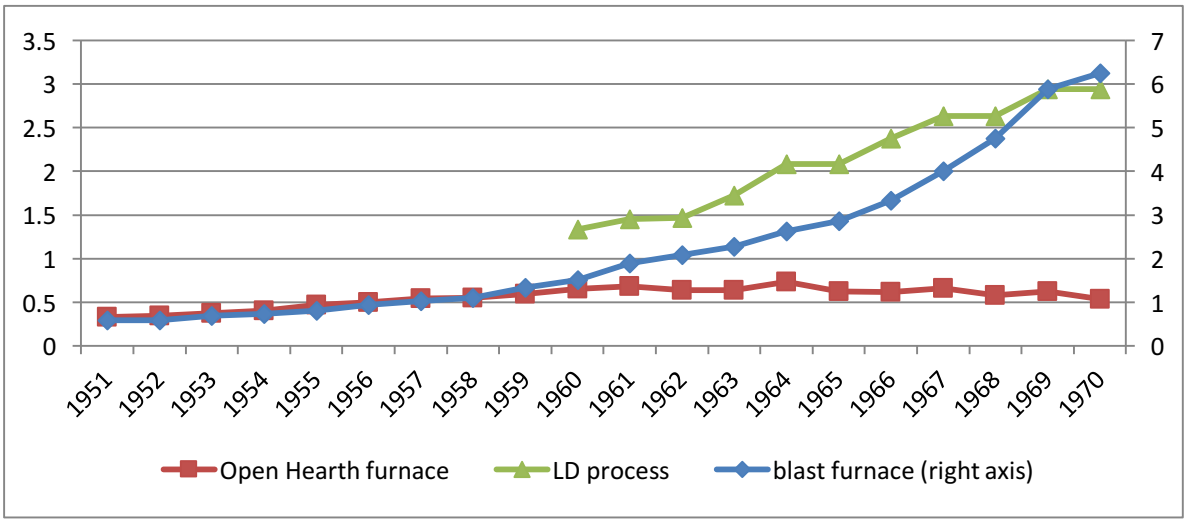
Export Competitiveness = (Production/Domestic Demand) – 1



Source: MITI (2001)

Japan shifted its dynamic industry from textile to heavy and chemical industries in the 1950s and the 1960s. Japanese export competitiveness of textile industry peaked in the 1960s. Figure 17 shows that labour productivity of blast furnace (pig iron) increased 6 times, and Introduction of Linz-Donawitz process (steel) increased productivity more than 5 times compared conventional open hearth furnace in the 1960s, making Japanese iron and steel industry most efficient in the world. Japan lost the dynamic comparative advantage in the heavy and chemical industries, and its export competitiveness peaked in the 1970s (Fig. 17). Japan shifted its dynamic industries successfully to mass production methods in machinery industries, such as automobiles and electrical machinery, from the mid-1970s onwards (Fig. 17).

Fig. 17 Labour productivity of iron and steel industry (1951-1970)



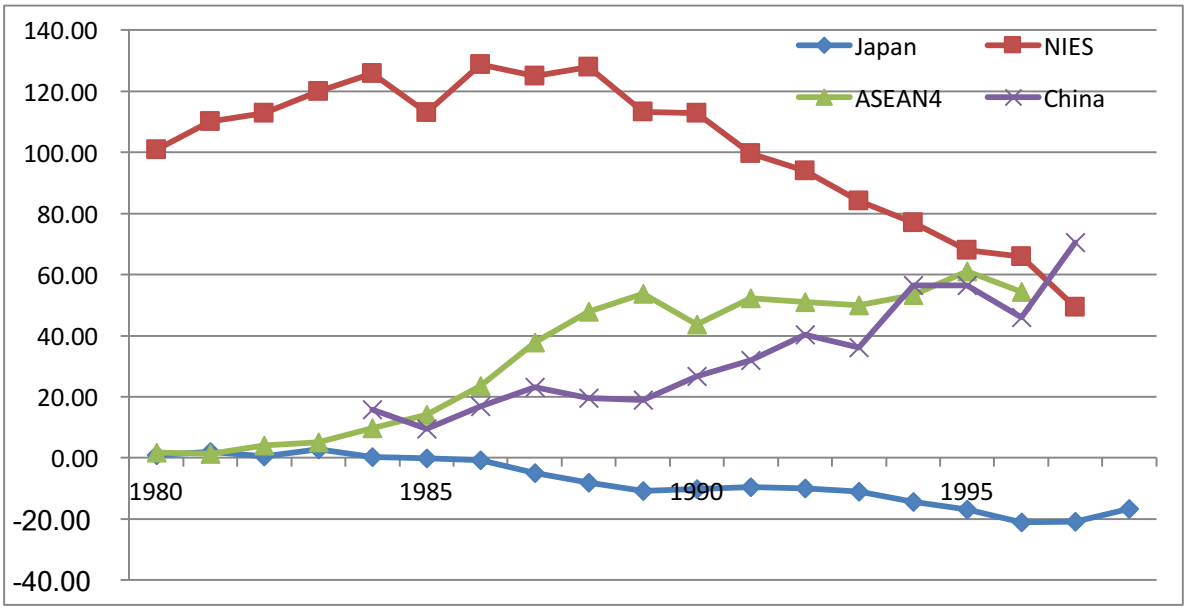
Labour productivity= ton/labour

Source: Ministry of Labour (quoted from Yoshikawa 2012)

Flying geese pattern industrialization in Asia

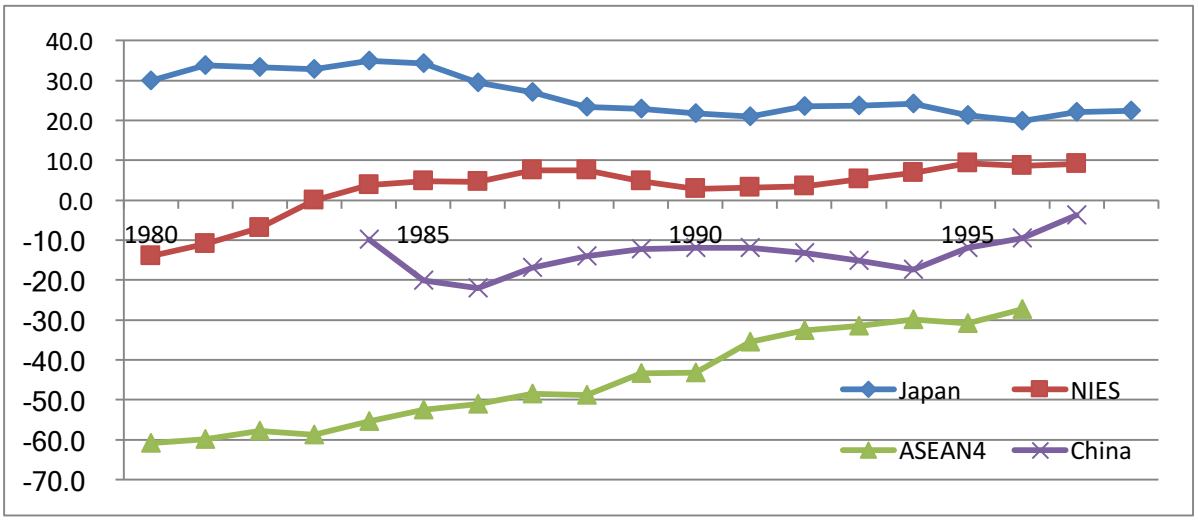
The upgrading of Japanese industries left room for less-developed East Asian countries to industrialize in the flying geese pattern (Fig. 18 and 19). NIEs started industrialization with light industries such as textile in the 1960s. Figure 18 shows that export competitiveness of textile industry peaked in the 1980s in Asian NIES. In the 1970s, the upgrading of Japanese industries left room for Asian NIEs to promote heavy and chemical industries and other more sophisticated industries (Fig 19). It enabled ASEAN 4 then China to industrialize in textile industries in the flying geese pattern. China leapfrogged ASEAN 4 both in textile and machinery in the 1990s.

Fig. 18 flying geese pattern III: Textile export competitiveness in Asian countries (1980-1997)



Source: MITI 2001

Fig. 19 Flying geese pattern III: Machinery Export competitiveness in Asian countries (1980-1997)



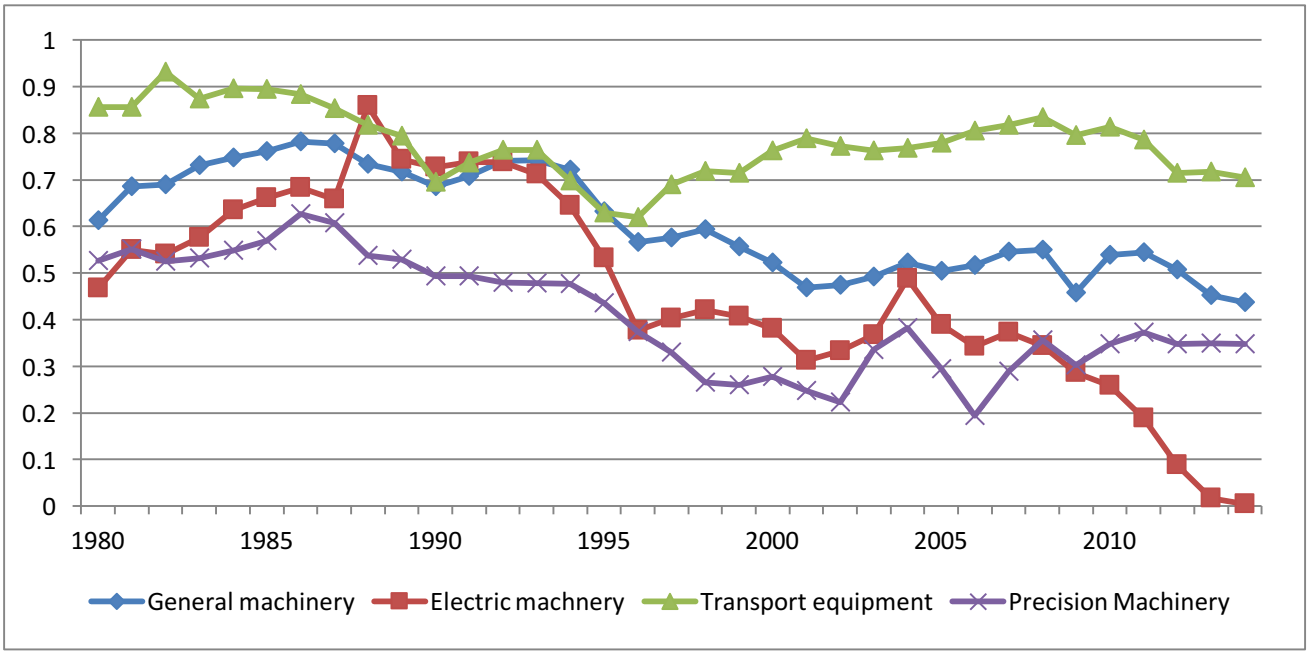
Source: MITI 2001

Asian Flying geese pattern industrialization in neoliberalism

After the structural crisis of the 1970s, Japan shifted its dynamic industries to machinery industries such as automobiles and electrical machinery. Japan adopted an export-led industrialization strategy increasing its trade dependency from 10% in the Golden Age to 15%. Asian NIEs shifted their dynamic industries to heavy and chemical industries with export-led growth strategies. In the first half of the 1980s, the US dollar was hugely overvalued against the Japanese, Korean and Taiwanese currency. Japan and NIES's export-led growth strategies were hugely successful in the first half of the 1980s. The total current account surpluses of Japan, Korea, and Taiwan were more than 50 percent of the world's combined surplus. After the Plaza accord of 1985, these countries' currencies appreciated rapidly which triggered structural changes of their accumulation regimes. Firstly, they increased foreign direct investment initially to ASEAN 4 (i.e. Indonesia, Malaysia, Philippines, and Thailand) and then to China to reallocate less sophisticated industries. In this period Japan created a Pacific Rim triangle trade regime whereby Japan exported capital goods to the ASEAN and China, and ASEAN and China exported completed products to the USA (Yokokawa 2013). Korea and Taiwan followed Japan to export intermediate goods.

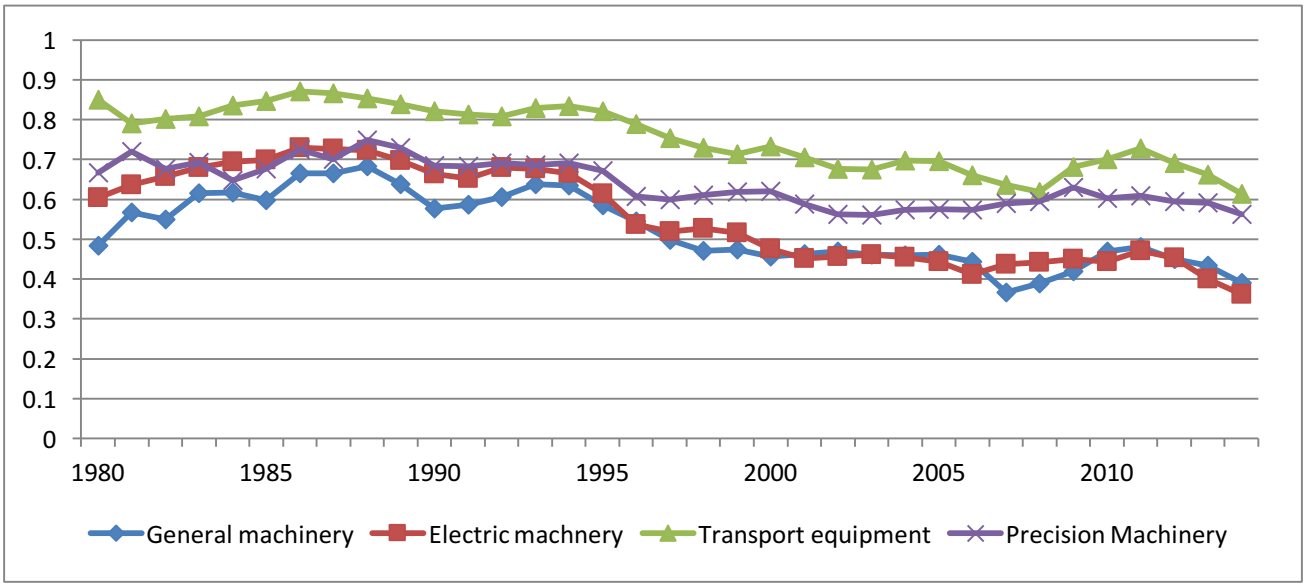
Japanese trade dependency fell to 10% again from 1985 to 2000. Figure 20 shows that Japanese trade specialization of final good in machinery industries peaked in the latter half of the 1980s then decreased significantly. Figure 21 shows that although Japanese specialization of intermediate goods peaked in the latter half of the 1980s, they kept high in the 2000s. They also show that Japanese trade specialization of transport equipment such as auto mobiles kept much stronger than that of other machinery.

Fig 20 Japanese trade specialization of final goods in machinery industries



Source: RIETY 2014. Trade specialization = (Export – Import) / (Export = Import)

Fig 21 Japanese trade specialization of intermediate goods in machinery industries



Source: RIETY 2014.

4. New dynamic industries: are they Japanese integral architecture or open modular architecture?

Toyotism and the integral product architecture

When Japan shifted its dynamic industry to automobile industry in the 1970s, the industry had already reached maturity in the USA and Europe. The Japanese car industry improved productivity by introducing the integral product architecture. Fujimoto (2014) defines it as follows. “Each component is functionally incomplete and interdependent with other components functionally and/or structurally. Designs of the components tend to be specific to each variation of the total system. For each product, components have to be optimized with the other component designs by mutual adjustment”.

The integral product architecture has strong complementarity with Japanese management system, which includes institutionalized incentives to develop contextual skills; subcontracting systems through which diverse components are efficiently supplied (just in time system) and through which subcontractors cooperate closely with prime contracting firms in product development. Integral product architecture, such as Toyotism, was very efficient, and quality and productivity of Japanese design and production makers in automobile and other machinery industries improved significantly in the 1980s.

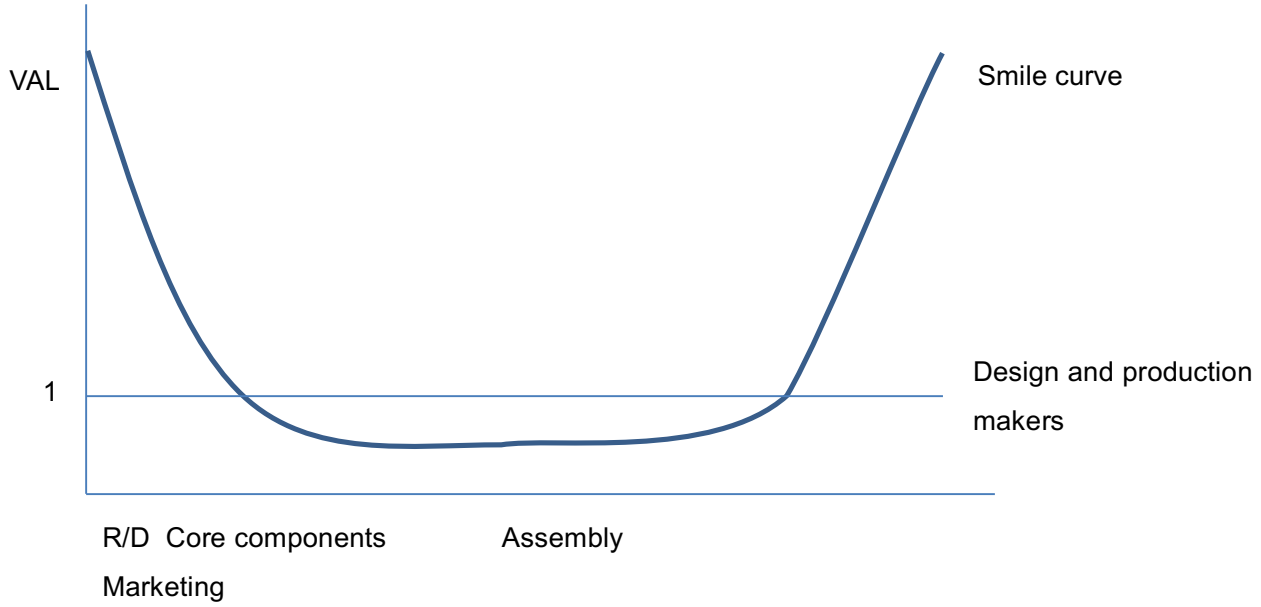
Open modular architecture

In the US the locus of dynamism shifted from mass-production system to information and communication technology (ICT) and knowledge intensive industries in the 1980s. Facing declining international competitiveness in manufacturing, US encouraged joint R and D based on consortia of firms to develop industry-wide consensus standard (Tatsumoto et al 2010). In consensus standardization, multiple firms built consensus and set the industry-wide standard in a cooperative manner. In the standardized open

area, implicit knowledge and know-how were revealed and became explicit (Tatsumoto et al 2010). It enabled new companies to compete with existing companies under the same conditions in the standardized open area. Fujimoto (2014) defines this product architecture as open modular architecture: "*Open architecture* is a type of modular architecture, in which 'mix and match' of component designs is technically and commercially feasible not only within a firm but also across firms."

Fig. 22 Disparity of VAL in global value chain

VAL of research and production maker = 1



Fierce price competition reduced VAL in the open area, while in the protected closed area that required high technology existing companies could enjoy high VAL. This change in the distribution of VAL led to a drastic change in the division of international labour and made vertical specialization in global value chain possible. Figure 22 shows the disparity of VAL in the global value chain, assuming VAL of design and production maker as unity. VAL of plat form leaders which specialize in closed area such as research and development, core components, and marketing is much higher than unity (for example 3), and that of assembly makers in the open area are much lower than unity (for example 0.2). Firms in advanced countries specialized in closed area differentiating products by technological accumulation and implicit knowledge, while firms in emerging countries welcomed open area with detailed standardization as a good opportunity for industrialization.

Platform leaders and vertical specialization

The open product architecture has strong complementarity with ICT and knowledge intensive industries. Breakthrough started in the 1990s. In the US, the platform business in the closed area has been most successful. The platform is composed of core components and other peripheries with standardized interfaces. US platform leaders successfully encapsulated their core technology and supplied them to

companies in emerging world (Vertical specialization). It made assembly makers in open area especially in developing countries to produce quality products easier and more competitive. Design and production makers in advanced countries are losing competitiveness to the combination of platform leaders and assembly makers in developing countries. For example design and production makers in personal computers such as IBM, Compaq, and Hewlett-Packard are losing competitiveness to the combination of Intel and assembly makers in developing countries (such as Quanta, Compal, Inventec, and other Chinese makers); in LCD TV, Sharp, Panasonic, and Sony are losing their competitiveness to the combinations of platform leaders (Genesis Microchip, Pixelworks, and Philips) and assembly makers in Korea, Taiwan, and China; and in mobile phone Nokia is losing its competitiveness to the combinations of platform leaders (Texas Instruments, Infineon Technologies, and MediaTek) and assembly makers in Korea, Taiwan, and China (Suehiro 2014).

It is not Japanese integral product architecture in machinery industries but US open product architecture with platform leaders in ICT and knowledge intensive industries that has become a new dynamic industry. Although integral architecture still shows strength in auto mobile industries, it may lose competitiveness when autonomous electric cars become dominant.

5. The rise of China

China's compressed industrialization

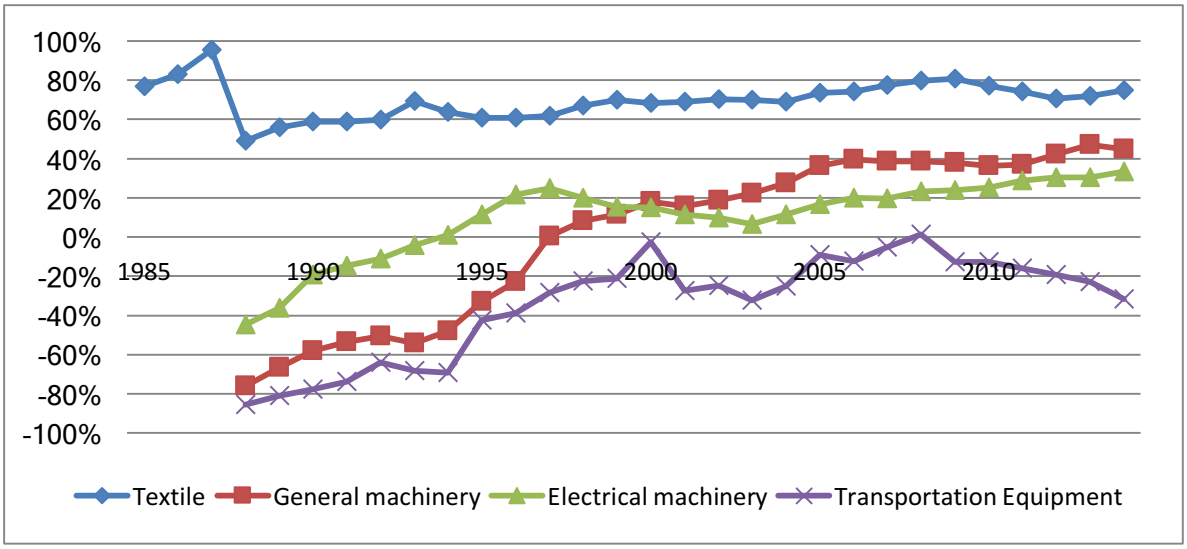
Chinese industrialization until the mid-1990s was based on cheap labour backed by state industrial, technological and trade policies[5]. Chinese wages were kept at 5 per cent of US levels by the devaluation of Yuan until then (Yokokawa 2013). Contribution by the structural change (3.47%) and the increase of VAL in second and tertiary sectors (3.21%) are quite large in the 1980s (Table 1). When its exchange rate was stabilized in the mid-1990s Chinese Lewis-type industrialization reached its limits. Its rapid wage rise was reflected in its trade specialization in light industries such as textiles and toys which peaked in the late 1980s (Fig. 24). In the 1990s and 2000s, open product architecture with vertical specialization enabled China's compressed industrialization. Chandrasekhar (2013, p. 83) noted: "There is a new international division of labour emerging in which Knowledge is controlled by firms in the developed courtiers even while the production of knowledge-based industries and services moves to countries like India and China." Chinese trade specialization in sophisticated industries such as electrical and general machinery increased rapidly from the mid-1990s onwards[6] (Fig. 23).

[5] "China had undertaken much less trade liberalisation than most other developing countries. This is why manufacturing employment grew so rapidly in China, because it was not counterbalanced by major losses of employment through the effects of displacement of domestic industry because of import competition" (Ghosh, 2016, p. 281). For ITT policies see Chang 2002.

[6] "The output of high-technology manufacturing located in China rose nine fold over the period 1995-2007 from $19 billion to &167 billion. . . . high-tech export from China rose rapidly after 2000" (Chandrasekhar 2013, p. 63).

Fig. 23 China's compressed industrialization (1985-2014)

Trade specialization = (export-import)/ (export+import)



Source: RIETI-TID, http://www.rieti-tid.com/

A China-centric Asian production network in the 2000s

Table 2 Chinese Trade

	Exports from China %					China's imports %				
	Japan	Korea + Taiwan	ASEAN5	USA	EU27	Japan	Korea + Taiwan	ASEAN5	USA	EU27
1991	13.1	3.4	4.8	18.5	16.7	18.1	1.7	6.1	15.6	17.5
1995	16.1	4.7	4.4	21.6	14.9	24.8	9.2	8.1	13.8	18.6
2014	8.0	6.1	7.2	20.9	19.7	11.0	12.6	10.0	9.2	14.5

ASEAN5=Indonesia, Malaysia, Philippines, Singapore, and Thailand.

Source: RIETI-TID, http://www.rieti-tid.com/

Table 2 shows that Japan's influence on the Chinese economy peaked in the early 1990s. After China became a member of the WTO, its share of international trade skyrocketed. Japanese goods exports to China and imports from China increased dramatically, raising Japanese trade dependence from 10% since 1985 to 15% again between 2002 and 2007. This enabled Japan to adopt export-led growth strategy again and to recover from the decade long depression. However, Japan could not keep pace with China, and its share in China's international trade was reduced both as exports and imports. Applying open architecture with vertical specialization China imports technology from the USA, capital goods from Japan, Korea, and Taiwan, and food and raw material from less developed countries, and exports completed products to the EU, USA, Asia, and other areas. The cross-border division of work and trade in Asia has been completely rebuilt by China, and the Japan-led Pacific Rim triangle trade

regime has been replaced by a China-centric Asian production network.

Conclusion

The rise and fall of Japanese economy may be summarized as follows. In the stage of diversification of Bureaucratic Capitalism, the center of economic growth shifted from the USA to Asia. Japan introduced integral product architecture in machinery industries and created Pacific Rim triangle trade regime. The USA created open modular architecture in ICT and knowledge intensive industries as the new dynamic industries, which successfully combined platform leaders in the USA and assembly makers in developing countries. The new dynamic industries enabled China's compressed industrialization, and the China-centric Asian production network replaced the Japan-led Pacific Rim triangle trade regime in the 2000s.

We are still at the beginning of the end of Bureaucratic Capitalism. Although ICT and knowledge intensive industries have high possibility to increase productivity with built-in software and the internet (IoT), developing productivity of ICT requires solving demand constraint by creative destruction of the neoliberal capital accumulation regime and creating a new production-led capital accumulation regime[7]. It requires following. Firstly, inequality of VAL between closed and open areas must be resolved. The non-rivalrous character of software-led ICT and other knowledge intensive industries with near zero marginal costs make it more and more difficult to keep closed area closed. Reduced deployment of the new dynamic industries has accelerated deindustrialization and increased income inequality in advance countries. On the other hand, low VAL distribution to developing countries made it impossible to increase demand in proportion to productivity increase in developing countries. It may require making these goods to public goods to reduce international VAL inequality. Secondly, inequality in the distribution of VAL between wages and profits must be reduced in order to make wages the engine of demand growth. Thirdly, a stable international monetary system such as Keynes' International Clearing Union, and the stable domestic monetary system must be recreated to reduce parasitic character of financialisation (Yokokawa 2016, Kregel 2015, and Ghosh 2016).

References

Akamatsu, K. (1962) "A Historical Pattern of Economic Growth in Developing Countries", *The Developing Economies, Institute of Asian Economic Affairs*, Preliminary Issue No.1, pp. 3-25.

Aoki, M. 2011. "The Five-Phases of Economic Development and Institutional Evolution in China and Japan", ADBI Working Paper 340. Tokyo: Asian Development Bank Institute. www.adbi.org/working-paper/2011/12/30/4836.five.phases.economic.dev.evolution.prc.japan/ Aoki

Chandrasekhar, C.P. "Knowledge and the Asian Challenge" in Yokokawa et al. eds. (2013).

[7] "Growth strategies need to change towards models that focus on the potential of domestic and regional markets, not just global markets. This means increasing employment and ensuring that wages increase with productivity" (Ghosh, p. 276)

Chang, Ha-Joon (2002) *Kicking Away the Ladder – Development Strategy in Historical Perspective*, Anthem Press.

Fujimoto, Takahiro (2014) “Architecture, Capability, and Competitiveness of Firms and Industries”, mimeo.

Glyn, A. (2006), *Capitalism Unleashed*, Oxford, Oxford University Press.

Ghosh, Jayati (2013) “Growth and emergent constraints in the Indian economy in the context of global uncertainty”, in Yokokawa et al. eds. (2013).

Keynes, J. M. (1980) The Collected Writings of John Maynard Keynes, Activities 1940-44 Shaping the Post-war world The Clearing Union, Vol. XXV, London: Macmillan for the Royal Economic Society.

Kregel, Jan (2015) “Emerging Market Economies and the Reform of International Financial Architecture:

The “exorbitant privilege” of the dollar is only the symptom of a structural problem”, Levy Economics Institute of Bard College, *Public Policy Brief,* No. 139, 2015

Minsky, Hyman (1992) “Chapter 7: Schumpeter and Finance”, pp. 103-115, in Salvatore Biasco, Alessandro Roncaglia and Michele Salvati, Eds. *Market and Institutions in Economic Development: Essays in Honor of Paulo Sylos Labini*. London, England, New York, NY: MacMillan, 1992.

MITI (2001) *White Paper on International Economy and Trade*.

Nihon Kokusei Zue (2013), Tokyo, Yano Tuneta Publish.

OECD (2014) “Long-term baseline projections” *Economic Outlook* No 95, May
http://stats.oecd.org/index.aspx?queryid=51396

Palley, Thomas I. (2010) “The Limits of Minsky’s Financial Instability Hypothesis as an Explanation of the Crisis” *Monthly Review*

Perez, Carlota (2003) *Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages*, Edward Elgar

RIETI (Research Institute of Economy, Trade and Industry), RIETI-TID, http://www.rieti-tid.com/

Rowthorn, R. E. (2016) “The emergence of China and India as great powers”, in Yokokawa et. al, eds. (2016).

Rowthorn, R. E. and Wells, J. R. (1987), *De-industrialisation and Foreign Trade*, Cambridge: Cambridge University Press.

Suehiro, Akira (2014) *Shinko Ajia Keizairon* (in Japanese), Tokyo, Iwanami.

Tatsumoto, Hirofumi, Ogawa, Koichi, and Shintaku, Junjiro (2010) “Standardization, International Division of Labor and Platform Business” *Tokyo University MMRC DISCUSSION PAPER SERIES*.

Vernon, Raymond (1966) “International Investment and International Trade in the Product Cycle”,

Quarterly Journal of Economics, Vol. 80, May pp. 190-207.

Yokokawa, Nobuharu (2012) “Cyclical Crisis, Structural Crisis, Systemic Crisis, and Future of Capitalism” in Yokokawa et al. eds.(2012).

Yokokawa, Nobuharu (2013) “The Renaissance of Asia and the Emerging World System” in Yokokawa Ghosh, and Rowthorn. eds. (2013).

Yokokawa, Nobuharu (2016) “Dynamic Comparative Advantage and the New Flying Geese Theory of Capitalist Development” in Yokokawa et. al. eds. (2016).

Yokokawa Ghosh, and Rowthorn. eds. (2013) *Industrialization of China and India: Their Impacts on the World Economy: Their Impacts on the World Economy*, Routledge.

Yokokawa, Kiichiro Yagi, Hiroyasu Uemura, and Richard Westra eds. (2016) *The Rejuvenation of Political Economy (Routledge Frontiers of Political Economy)*.

Yoshikawa, Hiroshi (2012) *Kodo Seicho*, Tokyo, Cyuou Koron Sha.