

Re-Emergence of Asia in Super Long Waves of Capitalist World Systems

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After the global financial crisis of 2008, the beginning of the end of the post-war capitalist world system has started. It may be characterised as an “interregnum”. It is a period of discontinuity in social order accompanied by widespread unrest, wars, and power vacuums. However, it is a most important period to create a more stable and egalitarian world system. In this paper, I will follow the framework of the long and super long waves of the capitalist economy, and examine the re-emergence of Asia and the rise and fall of the Japanese economy. Then I argue that the second interregnum is approaching.

1. Dynamic industries

In the history of capitalism, clusters of new technological innovations emerged several times. Dynamic industries are leading industries where clusters of innovations accelerate productivity growth.

- (1) The first industrial revolution: mechanisation of the cotton industry, wrought iron, the steam engine, and railways.
- (2) The second industrial revolution: cheap steel, electrical machinery, the internal combustion engine, synthetic dyes, and artificial fertilisers.
- (3) The third industrial revolution: the medium-high-technology (MHT) industries including mass-produced automobiles, petrochemicals, electricity, and home electrical appliances.
- (4) Knowledge-and technology-intensive (KTI) industries. There are five service industries (financial, business, communications, education and healthcare) and five high-technology (HT) manufacturing industries (aerospace, pharmaceuticals, computers and office machinery, semiconductors and communications equipment, and measuring, medical, navigation, optical, and testing instruments).

How to measure the productivity of dynamic industries

Marx (1976) was the first person who paid attention to physical productivity and market value. He argued in his theory of extra surplus value and relative surplus value as follows:

- (1) Increase of productivity reduces costs of production, and it creates extra surplus value with the existing market value.

(2) When the new market value is established with the diffusion of the new technology, extra surplus value is reduced, and prices are reduced to the prices of production. If this occurs in the case of wage goods directly or indirectly, relative surplus value is created.

As Marx argued, value added per labour (VAL) is decomposed into the volume/quantity of product per labour (Q) and value added per product (λ).

$$VAL = Q\lambda$$

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 (λ) 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 the value added per product (λ) is reduced. Taking VAL on the vertical axis and time on the horizontal axis, the trajectory of VAL follows a bell-shaped curve, which shows that the VAL of dynamic industries increases with the increase in labour productivity Q and eventually decreases with the decrease of λ .

The comparative advantage of dynamic industries (DCA)

DCA is defined by the difference of the rate of surplus value between dynamic industries (s_t) and the average rate of surplus value (s^*) where s_t is the rate of surplus value of dynamic industries at time t ($s_t = (Q_t\lambda_t - w_t)/w_t$)

$$DCA = s_t - s^*$$

DCA increases at first and eventually decreases, reflecting the creation of extra surplus value in dynamic industries and its eventual extinction. The trajectory of DCA also follows the bell-shaped curve.

The international comparative advantage of dynamic industries (IDCA)

IDCA is determined by differences in the rates of surplus value of the same industries between countries.

The rate of surplus value of an industry i in country A and B is defined as follows, where ULC is the unit labour costs (w/Q).

$$s_{Ai} = (Q_{Ai}\lambda_{Ai} - w_{Ai})/w_{Ai} = (\lambda_{Ai}/ULC_{Ai}) - 1. \quad s_{Bi} = (\lambda_{Bi}/ULC_{Bi}) - 1$$

Since the international price of the same commodity is the same, we assume that value added per product (λ) of the same commodity is the same. IDCA is defined as follows.

$$IDCA = s_{Ai} - s_{Bi} = (\lambda/ULC_{Ai}) - (\lambda/ULC_{Bi}) = \lambda(ULC_{Bi} - ULC_{Ai})/(ULC_{Bi} \times ULC_{Ai})$$

Both λ and $(ULC_{Bi} \times ULC_{Ai})$ are positive. The IDCA of industry i between two countries is determined by the difference of unit labour costs.

Assessment of the degree of IDCA

IDCA is assessed through an examination of domestic and worldwide market share trend (NSB 2002) either by export competitiveness $\{(Production/Domestic Demand) - 1\}$ or by export specialization $\{(Export - Import)/(Export + Import)\}$ depending on available data.

2. Three waves of capitalists economy: business cycles, long waves, and Super long waves

Table 1 shows that three waves are observed in a capitalist economy.

Table 1 Dynamic industries and three waves

Stylised facts: Three waves	Working hypothesis
Business cycles (cyclical crisis)	Fixed-capital investment cycles
Long waves (structural crisis)	Creation, development, and maturity of dynamic industries and techno-economic paradigm
Super long waves (systemic crisis)	Formation, establishment, and diversification of capitalist world systems

Business cycles: dynamic industries and cyclical crisis

Figure 1 shows the relationship between business cycles and long waves in a closed capitalist economy, taking VAL on the vertical axis and time on the horizontal axis (Yokokawa 2016).

(1) New technology is introduced to dynamic industries in year 11. When capital accumulation

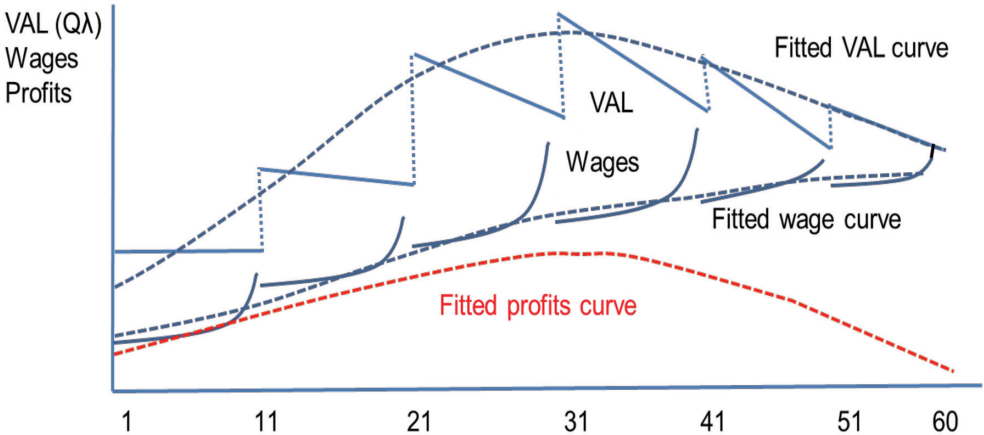


Fig. 1 Business cycles and long waves

increases in the dynamic industries, capital accumulation in other sectors also increases.

(2) When the new technology spreads with the progress of prosperity, the prices of the products and VAL of the dynamic industries are reduced. Increased demand for labour raises wages and reduces the profits of the dynamic industries. It causes a cyclical crisis, which spread to other sectors.

(3) In dynamic industries, new technologies are introduced in year 21 by replacing old fixed capital. It increases VAL. Then the accumulation of capital recommences starting a new business cycle.

(4) Through business cycles, DCA of dynamic industries increases and then decreases.

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

Figure 2 shows that long waves are explained by creation, development, and maturity of Dynamic industries and techno-economic paradigm. Total value added (TVA) = $Q\lambda L$, where L is employment.

(1) Creation of a new dynamic industry B in the established stage of a capitalist world system

When old dynamic industries A lose its DCA, search for new dynamic industries starts. Then investment concentrates in the new dynamic industries B, and often 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 industry B (techno-economic paradigm).

(2) Development

The new dynamic industry B becomes the engine of economic growth. Through business cycles, their DCA increases and then decreases.

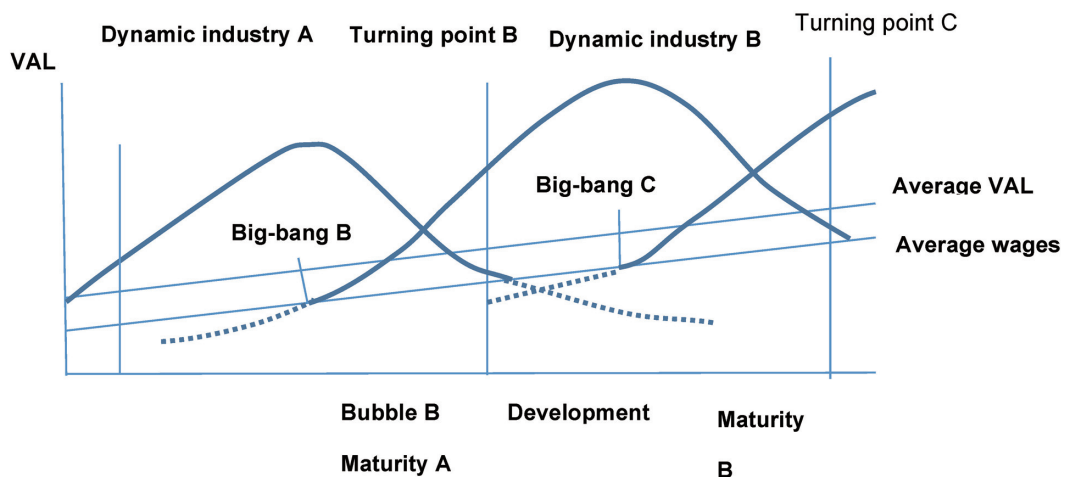


Fig. 2 dynamic industries and long waves

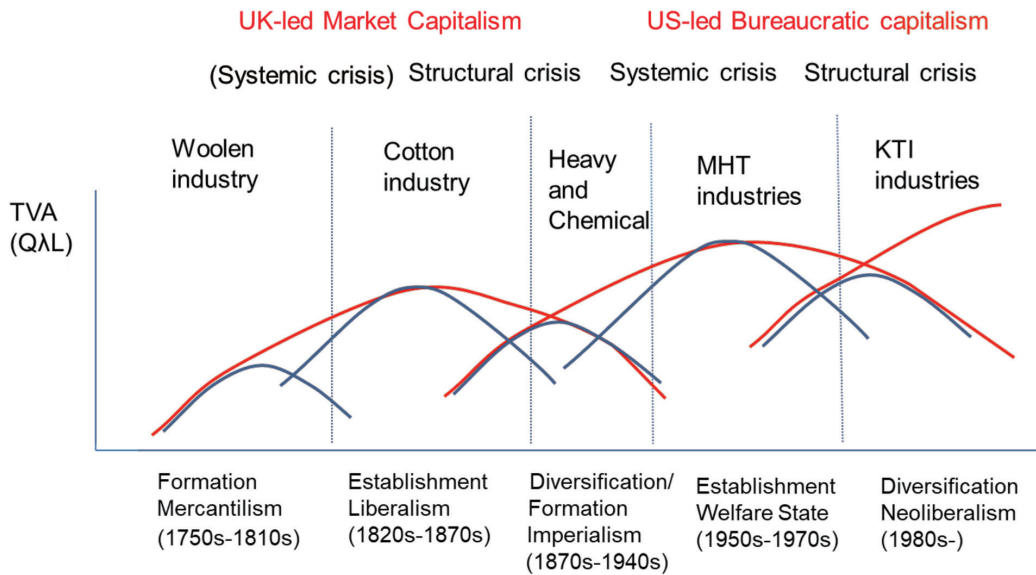


Fig. 3 Long waves and super long waves

(3) Maturity

Reduction of the prices of products of dynamic industries B revitalises mature industries through lower input prices raising their rate of surplus value. Capital accumulation continues. When the available labour of the industrial reserve army is eventually absorbed, wages in lagging sectors increase.

(4) Structural Crisis

When average wages further increase and the average profits are squeezed, production in many industries cannot continue. It causes a severe structural crisis of the accumulation regime B.

(1') Diversification

If a new dynamic industry C and a new techno-economic paradigm are created, a new long wave starts. If the new techno-economic paradigm is not created, the centre of the new dynamic industries shifts.

Super long waves

Five long waves have been observed corresponding to the rise and fall of dynamic industries. Two super long waves have been observed corresponding to the rise and fall of capitalist world systems¹.

¹ Capitalist world systems are named after the characteristics of the capital accumulation regime in their established stage. Market capitalism is characterised by private ownership, free competition, and small non-interventionist states. Bureaucratic capitalism is characterised by well structured bureaucratic systems of firms, governments, and international organisations.

(1) UK-led Market Capitalism

(1) Formation

Britain started industrialisation in the woollen industry following the Low Countries. Mechanization of cotton industries began at the end of the 18 century in Britain.

(2) Establishment

The first capitalist world system, Market Capitalism, was established by Britain in the early 19th century with cotton and railway industries as the dynamic industries and foreign demand as the engine of demand growth.

(3) Diversification

After the structural crisis (the long depression), Imperialism reshaped Market Capitalism. The locus of dynamism shifted to heavy and chemical industries, and the centres of economic growth shifted from the UK to the US and Germany.

(4) Interregnum: The last phase of the diversification stage

The structural crisis of imperialism developed into the systemic crisis (the great depression) which abolished UK-led Market Capitalism.

(2) US-led Bureaucratic Capitalism

(1) Formation

The stage of diversification and systemic crisis of Market Capitalism overlapped the formation stage of a new capitalist world system.

(2) Establishment (the Golden Age)

After World War II, the USA established a new capitalist system, Bureaucratic Capitalism, with the Bretton Woods system, Welfare state, and mass production system as the new dynamic industries. It established the mutually reinforcing mechanism between productivity growth and economic growth with wages as the engine of demand growth, resulting in the long-lasting prosperity of the 1950s–1960s with occasional recessions.

(3) Maturity and Structural Crisis

The long-lasting high rate capital accumulation itself made further accumulation difficult in the 1970s. Increases in wages under a declining VAL reduced the DCA. Wage pressure contributed to a squeeze on profitability, causing a structural crisis in the 1970s.

(4) Diversification of Bureaucratic Capitalism

After the structural crisis of the 1970s, the Anglo-American neoliberal accumulation regime reshaped Bureaucratic Capitalism. The centre of economic growth shifted from the USA and Europe to Asia.

3. The new flying geese theory

Industrialization in East Asia has been studied in the framework of Akamatsu's flying geese theory (Akamatsu 1962). It is the most original framework for the analysis of East Asian industrialisation (Yokokawa 2013). The new flying geese theory is an intermediate theory that explains economic development within the framework of long and super long waves of the capitalist world system.

The first thesis

Flying geese pattern I A: Catch-up industrialisation in the established stage of a capitalist world system

- (1) Dynamic industries are first developed in advanced countries. Demand for their products develops in advanced countries.
- (2) As the dynamic industries develop in advanced countries, VAL increases. Output (TVA) expands to achieve economies of scale, and exports begin.
- (3) With the further spread of production, falling VAL increases unit labour costs which decrease IDCA.

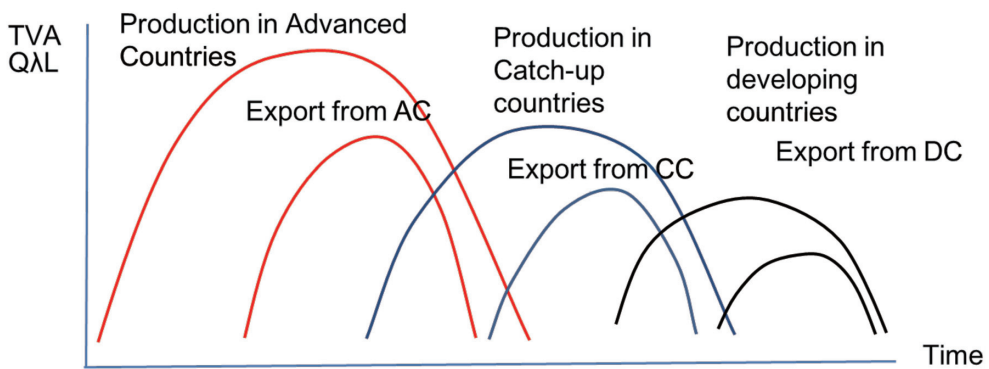


Fig. 4 Flying Geese pattern I A

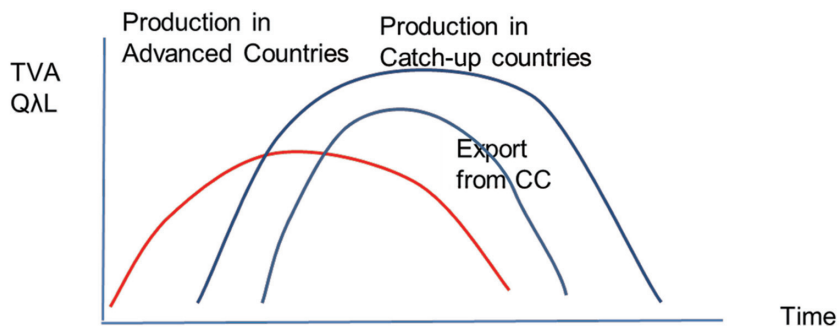


Fig. 5 Flying Geese pattern I B

- (4) Production moves to less-developed countries with lower wages and lower unit labour costs.
- (5) Finally, the foreign-produced commodity is imported.

New flying geese pattern I B: leap-frogging industrialisation in the diversification stage of a capitalist world system

- (1) Dynamic industries are first developed in advanced countries.
- (2) If a new capital accumulation regime is not created, demand for the products does not increase in proportion to increase in productivity. Deployment of the productivity and increase of VAL are limited.
- (3) It makes catch-up easier for less developed countries, and production moves to less-developed countries with lower wages and lower unit labour costs.
- (4) If a new accumulation regime to accommodate the new dynamic industries is created in catch-up countries, production expands to achieve economies of scale, and exports begin. Global overproduction or underconsumption may occur.

The second thesis

Flying geese pattern II A: Linear development path

Akamatsu emphasised a linear development path, and argued that latecomers should imitate the path taken by industrialised countries, and shift specialisation towards more capital- and skill-intensive industries when they have lost existing DCA.

- (1) Advanced countries have to build new dynamic industries and techno-economic paradigms after the structural crisis to keep the status of the advanced country. If they cannot, they become a follower.
- (2) Developing countries shift specialisation toward more sophisticated industries when they lose existing dynamic comparative advantages.

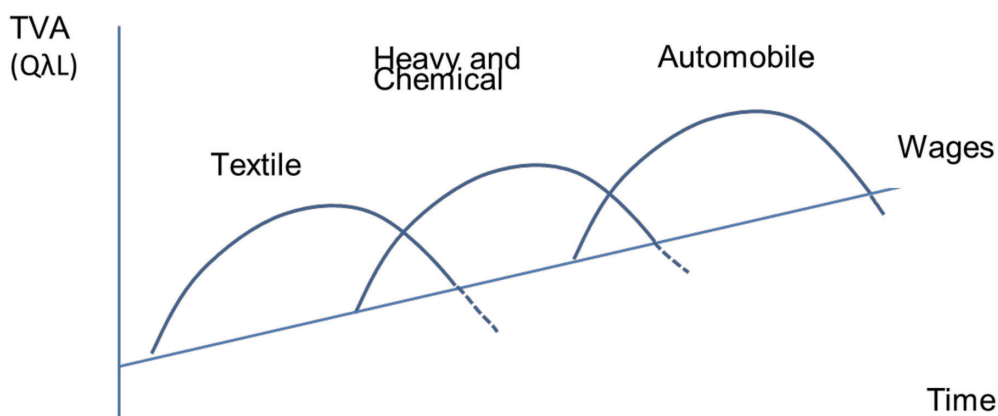


Fig. 6 Flying geese pattern II A: Linear development path

New flying geese pattern II B: compressed industrialisation

Figure 7 shows that new dynamic industries have been introduced before old dynamic industries mature (Flying geese pattern II B, or compressed industrialisation). At time 1, heavy and chemical industries had been introduced when textile industries were still in development; MHT industries had been introduced when the heavy and chemical industry was still in development, and KTI industries had been introduced when MHT industries were still in development. Gerschenkron emphasises that developing countries can introduce the most advanced technology available in their industrialisation (Gerschenkron 1962, p. 9 and 26). Whittaker (Whittaker et al. 2010) argues that for countries like China and India which are industrialising today, most advanced technologies are available for all industries, and they can have the same dynamic comparative advantage in all industries. The compressed industrialisation was made possible in the diversification stage of Bureaucratic Capitalism especially after the 1990s with the increased international trade of intermediate goods and vertical specialisation within global value chains. It

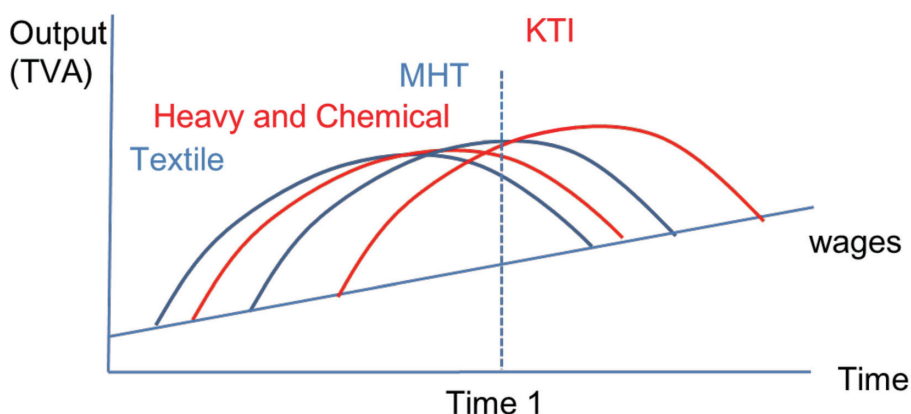


Fig. 7 Flying geese pattern II B: compressed industrialisation

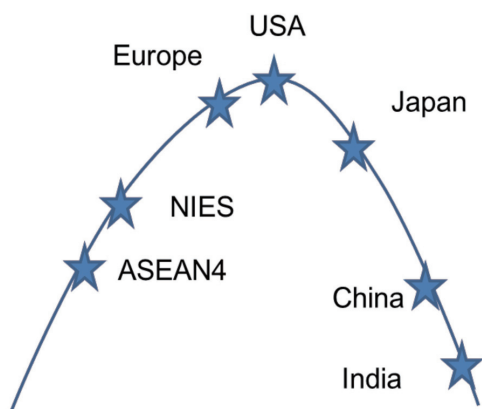


Fig. 8 Flying geese pattern III A

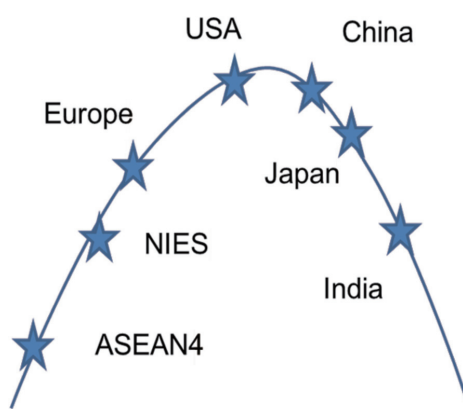


Fig. 9 Flying geese pattern III B

made leapfrogging among catch-up countries possible.

The third thesis

Flying geese pattern three is “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, since Akamatsu sees the flying geese pattern only from the catch-up countries’ point of view (Flying geese pattern III A). In the new flying geese theory (Flying geese pattern III B) 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 strategies adopted by the countries when they face structural crises in a capital accumulation regime and the uneven development of dynamic industries. The leapfrogging among catch-up countries are explained by compressed industrialisation. Flying geese theory with the top goose changing from time to time fits better with the theory of super long waves of the capitalist world system.

4. Re-emergence of Asia

The rise and fall of Japanese Economy

Figure 10 shows that Asia’s share of the world GDP was 60 % in 1820. It dropped significantly in Market capitalism (15 %). Only Japan successfully industrialised in its diversification stage. Asia’s Reemergence started in the golden age of Bureaucratic capitalism and accelerated in its diversification stage (35 % in 2014).

Figure 11 shows that Japanese GDP share in selected Asian Economies peaked at 60 % in the mid-1990s and reduced to 20 % in the 2010s (IMF WEO 2016). OECD’s 2014 “Long-term baseline projections” projected that by the latter half of this century Japanese world GDP share will

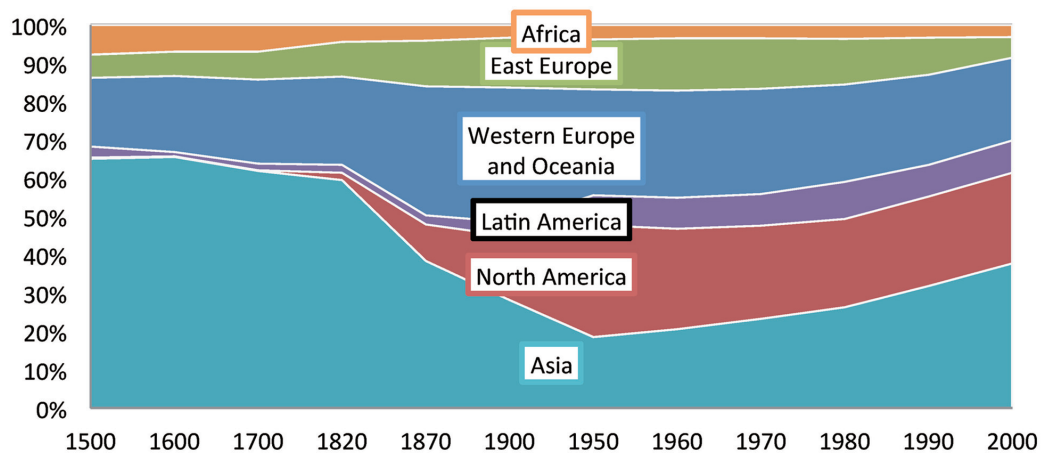


Fig. 10 World GDP share (1500–2000)

Source: Maddison 2007

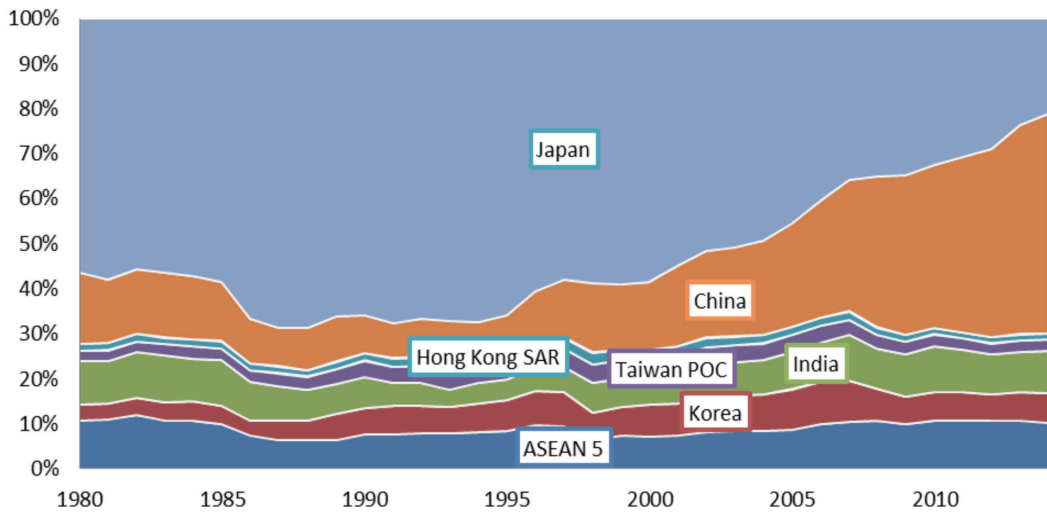


Fig. 11 The rise and fall of Japanese GDP shares among selected Asian Countries
Source: IMF WEO 2016

decrease from 6.9 % in 2010 to 3.2 %, while that of China will increase from 15.6 % to 24.6 %, and that of India from 6.1 % to 17.9 %.

Japanese dynamic industries (1965–1998)

Japanese industrialisation took flying geese pattern IIA. Figure 12 shows that in the 1950s and the 60s, Japanese dynamic industries shifted from textile to heavy and chemical industries. In the 1970s, Japan lost IDCA in the heavy and chemical industries. Japan shifted its dynamic industries to more sophisticated mass production methods in machinery industries.

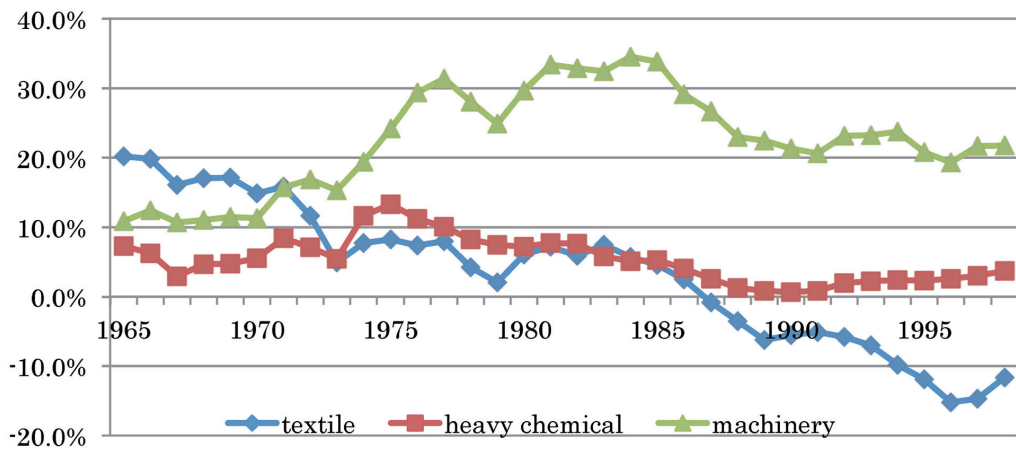


Fig. 12 Flying geese pattern II A: Export competitiveness of Japanese industries
Export competitiveness = (Production/Domestic Demand) - 1.
Source: MITI (2001)

Flying geese pattern III A and III B in Asia (1980–1997)

The upgrading of Japanese industries left room for less-developed East Asian countries to industrialise in the flying geese pattern III. Figure 13 and 14 show that the newly industrialising economies (NIEs) started industrialisation with light industries in the 1960s. In the 1970s, NIEs promoted heavy and chemical industries and then other more sophisticated industries (IIA). It enabled ASEAN 4 then China to industrialise following NIEs (III A). China leapfrogged ASEAN4 in the 1990s (III B).

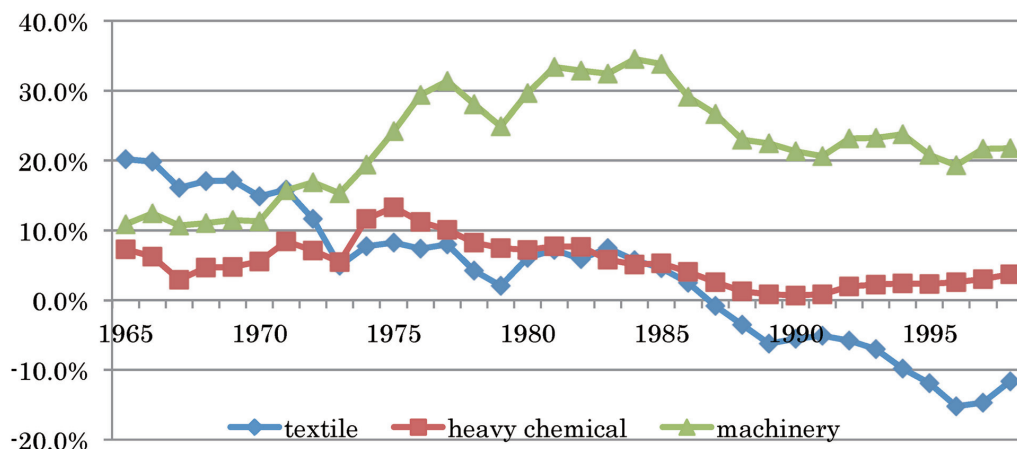


Fig. 13 Flying geese pattern III: Textile export competitiveness in Asian countries

Source: MITI (2001)

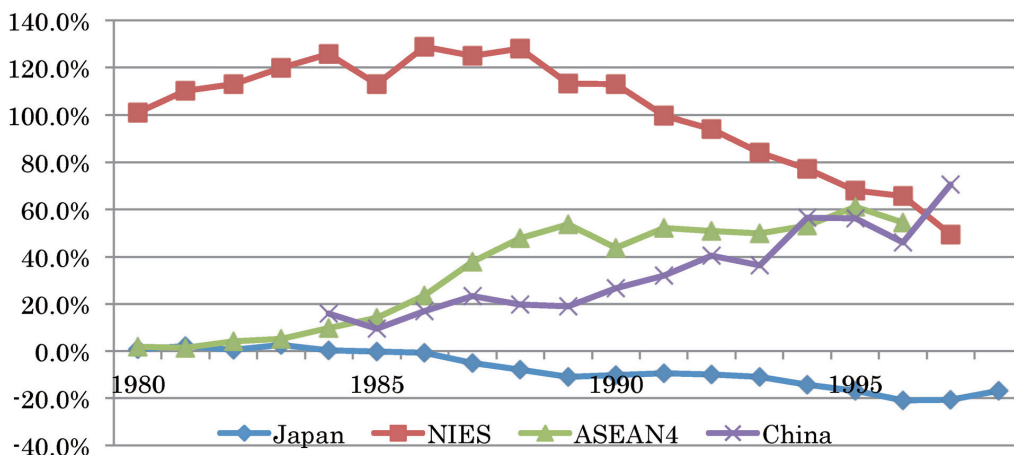


Fig. 14 Flying geese pattern III: Machinery export competitiveness in Asia

Source: MITI 2001

The innovation of Dynamic industries in the diversification stage of Bureaucratic Capitalism

Two promising innovations in MHT manufacturing industries appeared in the diversification

stage of Bureaucratic Capitalism. One is the integral production architecture developed in Japan. The other is the open modular architecture developed in the USA.

(1) Toyotism and integral product architecture

Fujimoto (2014) defines integral architecture 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”. Integral architecture, such as Toyotism, had strong complementarity with Japanese management system. It was very effective, and quality and productivity of Japanese design and production makers in automobile and other machinery industries improved significantly in the 1980s.

(2) Open architecture

In the 1980s, US encouraged joint R&D based on consortia of firms to develop industry-wide consensus standard. In the standardised open area, implicit knowledge and know-how were revealed and became explicit. In the closed area, US manufacturing platform leaders successfully encapsulated their core technology with chipsets which are composed of a core component and other peripheral with standardised interfaces. Fierce price competition reduced VAL in the open area, while in the protected closed area platform leaders enjoyed high VAL.

This change in the distribution of VAL led to a drastic shift in the division of international labour (Fig. 15). Platform leaders supply core chipsets to assembly makers. It made assembly makers in developing countries produce quality products such as personal computers, LCD TVs, and mobile phones easier (vertical specialisation). It decreased the export competitiveness of design and production makers in advanced countries.

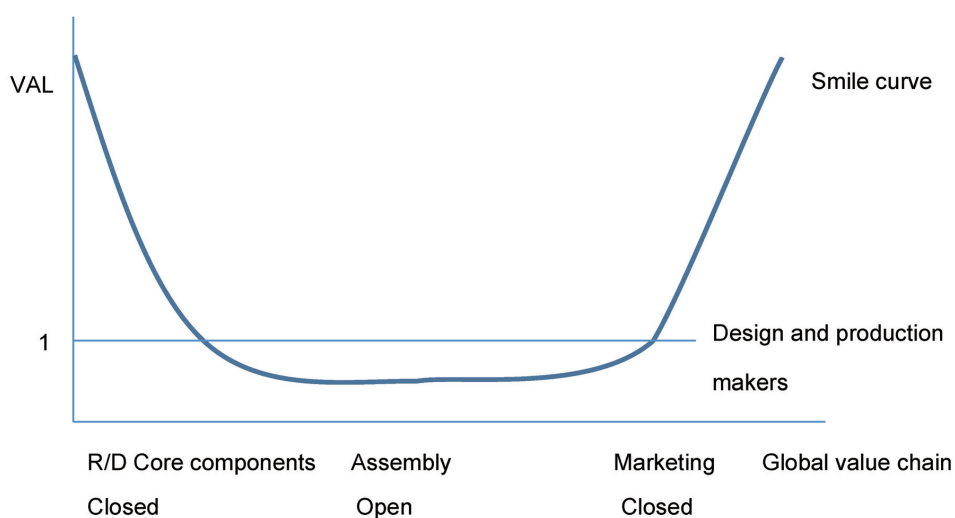


Fig. 15 The Smile curve: disparity of VAL in global value chain

5. China's compressed industrialisation and KTI industries

China's compressed industrialisation

Chinese industrialisation until the mid-1990s was based on cheap labour and aggressive state trade policies. In the 1990s and 2000s, open architecture with a vertical specialisation in global value chain enabled China's compressed industrialisation in sophisticated industries (Fig. 16). Open architecture with vertical specialisation increased China's export competitiveness of goods in MHT industries.

Figure 17 shows that IDCA of Chinese MHT industries is surpassing that of all the advanced countries (NSB 2018). It shows that MHT industries had become mature industries, and could not

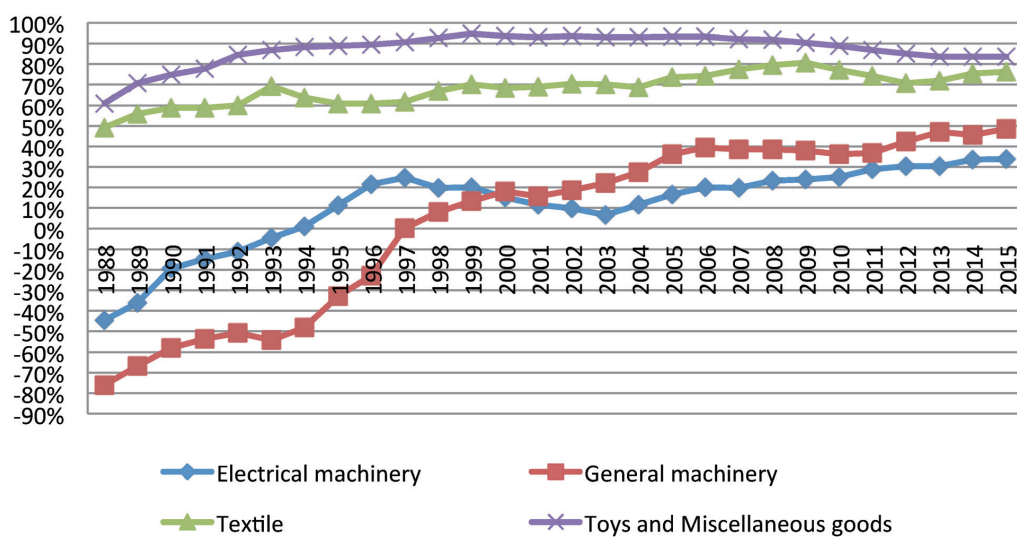


Fig. 16 China's export specialization 1988-2015

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

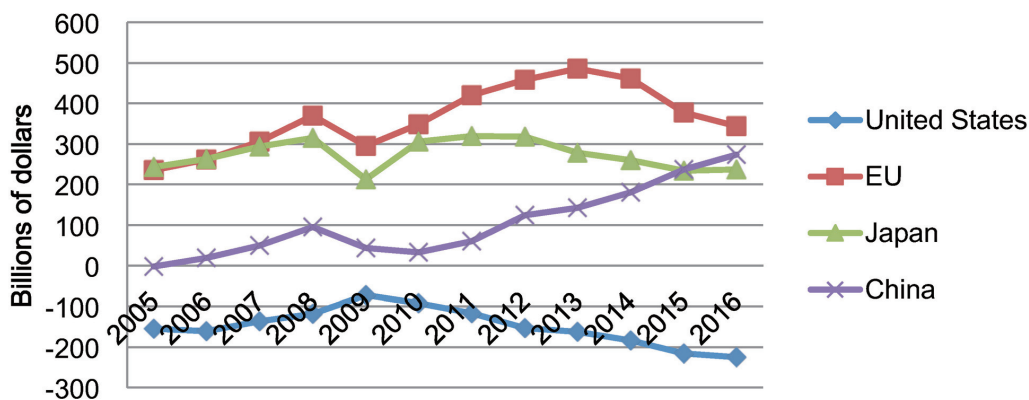


Fig. 17 Trade balance of MHT products

Source: NSB 2018

perform the role of the engine of economic growth for advanced countries such as Japan.

Knowledge-and technology-intensive (KTI) industries as the new dynamic industries

Figure 18 shows that KTI industries (five KI service industries and five HT manufacturing industries) have established themselves as the new dynamic industries in the past quarter-century. The open product architecture has strong complementarity with KTI industries. The USA is the most successful and keeps the leader status in the new dynamic industries. China is the most dynamic to emulate among catching-up countries and has leapfrogged Japan in the new dynamic industries.

While the output of KTI industries in the USA grows 80% between 2001 and 2016, that in China grew 895% and in Japan 15% (Fig. 19). It is commercial knowledge-intensive services (financial, business, communications services; KI services) that made this difference. While the output of KI services in the USA, Japan and China in 2001 were 2093, 700, and 167 US billion dollars respectively, those in 2016 were 3651, 751, and 1934 US billion dollars respectively (Fig. 20). Trade balance of the Japan, USA, and China in KI services —at 32 US billion dollars deficit, 81 US billion dollars surplus, and 20 billion dollars surplus respectively in 2016— further shows that Japan was unsuccessful in developing KI services, while the USA and China were successful (Fig. 21).

The same trend is observed in HT manufacturing industries to a lesser degree. The outputs of HT manufacturing industries in the USA, Japan and China in 2016 were 495, 102 and 380 US billion dollars respectively (Fig. 22). Japan and the USA had trade deficits at 10 billion dollars and 61 billion dollars respectively in HT manufacturing industries, while China had a trade surplus at 93 billion dollars in 2016 (NSB 2018).

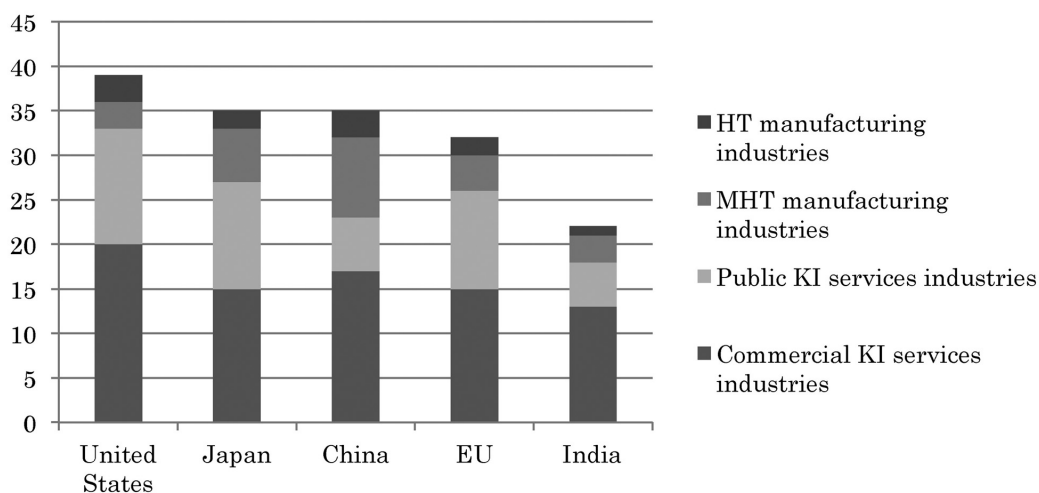


Fig. 18 The output of KTI industries as a share of the GDP in 2016

Source: NSB 2018

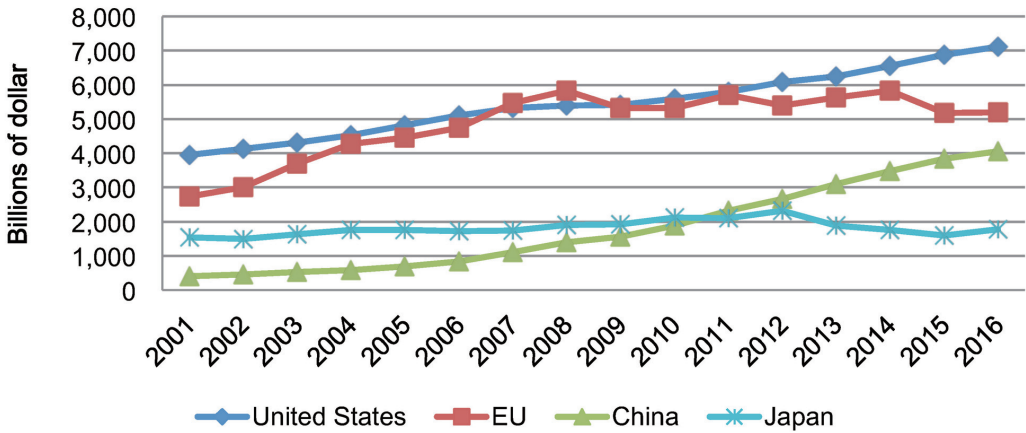


Fig. 19 Value added of KTI industries
Source: NSB 2018

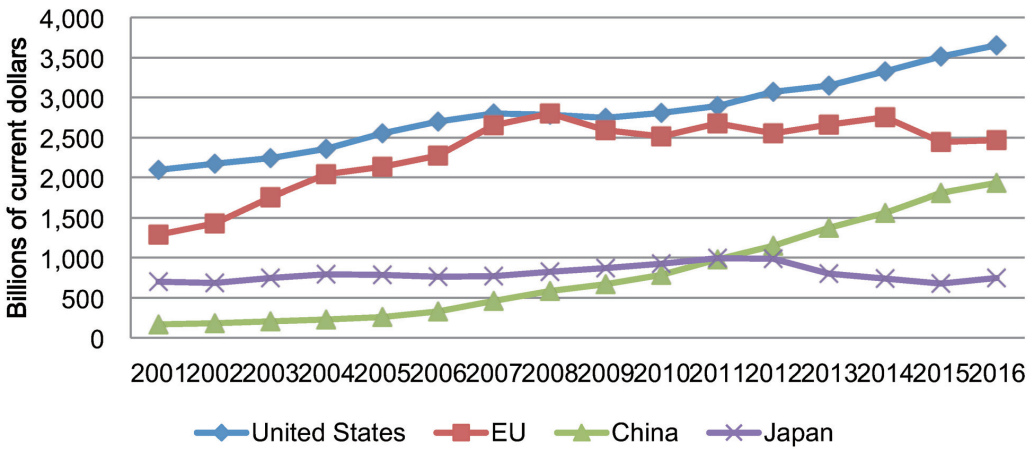


Fig. 20 Value added of commercial KI services 2001-16
Source: NSB 2018

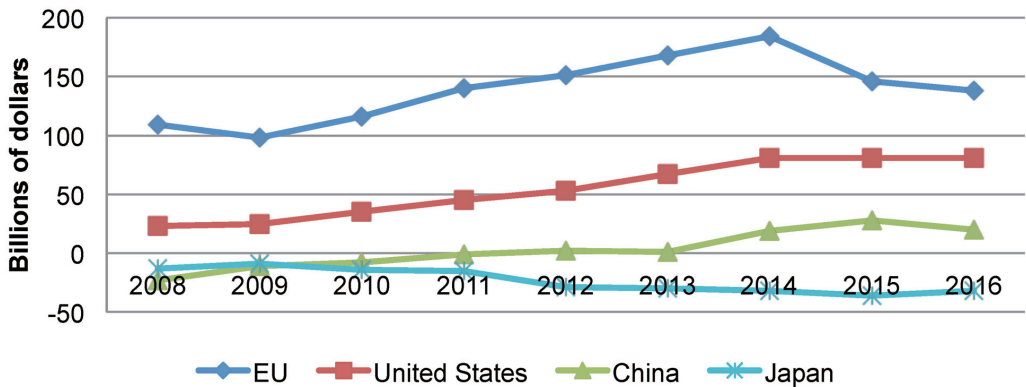


Fig. 21 Trade balance of commercial KI services
Source: NSB 2018

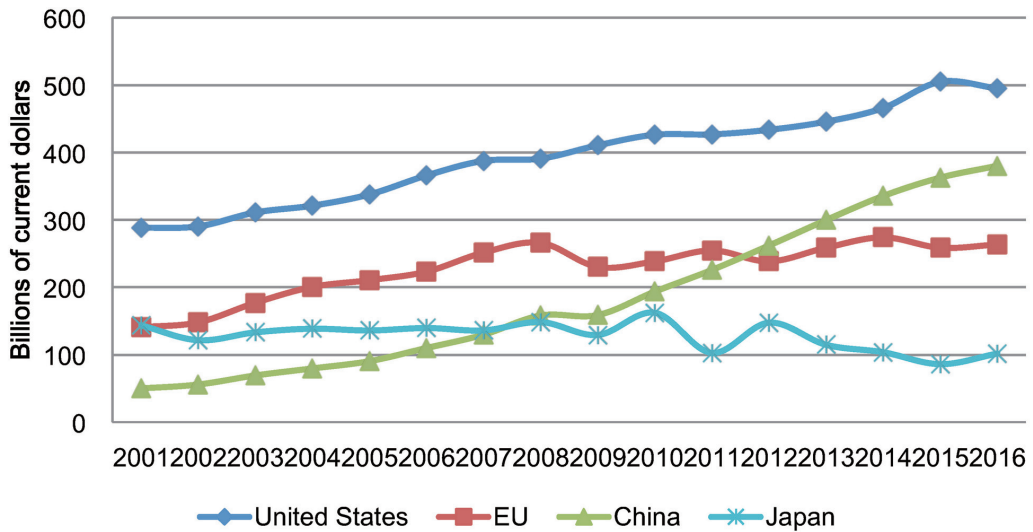


Fig. 22 Value added of HT manufacturing industries 2001-16
Source: NSB 2018

It has become quite clear that China is the most successful in catching up with the USA in the new dynamic industries not only in manufacturing but also in services, and that Japan lost IDCA in the new dynamic industries not only in services but also in manufacturing.

A new interregnum?

China's catching up in the new dynamic industries is faster than expected (Yokokawa 2016). It will change the distribution of VAL between the USA and China in the new dynamic industries. The smile curve of new dynamic industries will be shallower, and the inequality of VAL between the closed and open areas will be reduced. It will also change inequality in the distribution of VAL between wages and profits in China. China has reached the Lewis turning point, and increased demand for labour increases wages. China has become too large to take the benefit of export-led industrialisation. It has to increase domestic demand for further growth making wages the engine of demand growth.

The present situation is becoming quite similar to the interregnum in the 1920s and 30s. Old hegemony, namely the USA and the EU, started to lose control, and potential new hegemony, China (and possibly India) are not ready to create the new world system. We have learned troubles in the previous interregnum the hard way. We should make a new stable and egalitarian world system without too much confusion and destruction.

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