

Ten Years after the Financial Crisis, Where is the Global Economy Headed?



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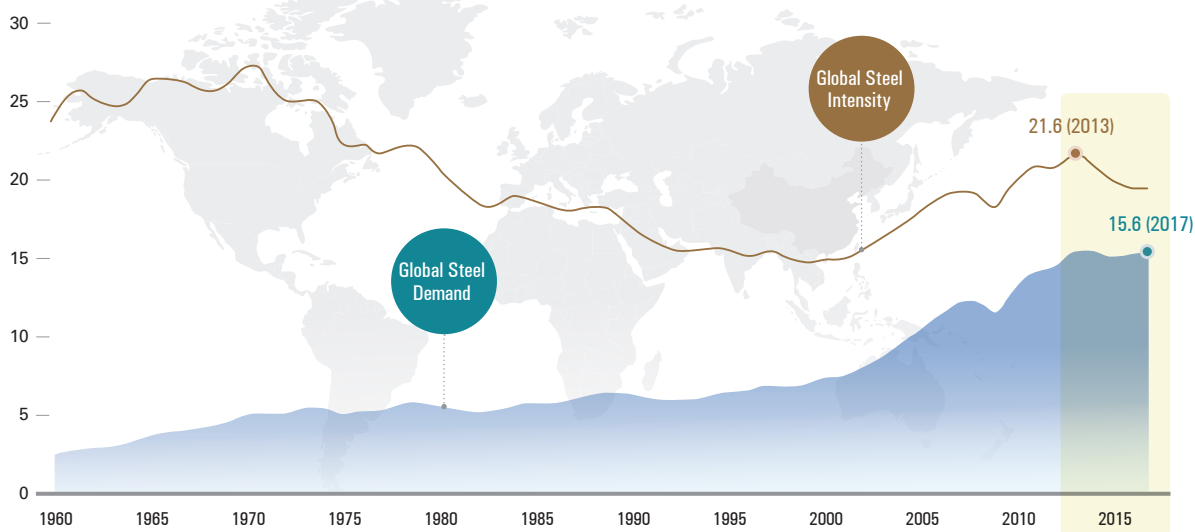
Ten years have passed since the outbreak of the global financial crisis in September 2008. The global economy has undergone significant changes in the intervening decade, and so has the global steel industry. The steel industry experienced quantitative growth through the 2000s thanks to the rise of emerging economies including China, but has experienced qualitative changes after the financial crisis. Steel intensity has gradually weakened after peaking in 2013 as global steel demand stagnated due to a slowdown in demand from China. The shift to a decline of the intensity after more than ten years of an upward trend, excluding the financial crisis period, marks a new inflection point for the steel industry. This is also true for the global economy over the past ten years. China and other emerging economies' investment in infrastructure, characterized by massive fixed capital investment before the financial crisis, has also slowed significantly. Steel companies formerly focused on quantitative

growth, but they are now turning toward new rising trends. Industry 4.0, which was initiated in Germany to counter manufacturing sluggishness after the financial crisis, is leading to the Fourth Industrial Revolution (4IR). This has been requiring steel-consuming industries such as the automotive sector to transform themselves, giving rise to new challenges for steel producers and their products and processes.

In this special report, we first evaluate the global economy over the ten years following the financial crisis. Then we suggest four major changes facing the global economy for the ten years to come. To this end, we speculate on the direction of the global economy, projecting world economic growth and three major economic variables—interest rates, the value of the US dollar, and oil prices. We also discuss the implications of these changes and the direction of the global economy for steelmakers and offer advice on how they can prepare for the next decade.

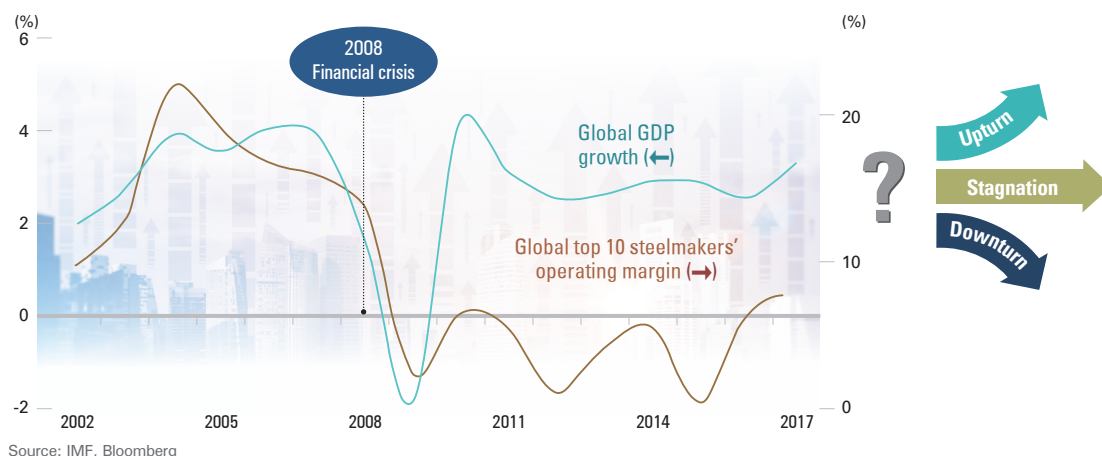
Figure 1. Global Steel Demand and Steel Intensity Trend

(100 Mt, tonne/USD million)



Source: worldsteel, World Bank, POSCO Research Institute

Note: Global steel intensity = Global steel demand/Global GDP

Figure 2. World Economic Growth vs. Global Top Ten Steelmakers' Operating Margins

Is the world economy recovering?

Over the last two years, the world economy has overcome a period of sluggishness and continued to improve, mainly driven by the US economy. However, there is room for doubt as to how long such recovery momentum can last. There is gaining evidence that the economy has already passed a peak, and financial instability in emerging economies is increasingly becoming evident.

Figure 2 illustrates that the world economy maintained a low growth rate, albeit one above 2%, after negative growth during the crisis. It then rebounded from 2017. During the low growth period, global steelmakers' operating margins tumbled to the low single-digit level, but began rising again thanks to the economic upturn of the last two years and the supply-side reforms in China. Global steelmakers are wondering how long the Chinese government would continue to constrain steel production. They are also hoping that the economic upturn will lead to a recovery in steel-consuming industries, including automobiles and construction, and that manufacturing trade growth will return to pre-crisis levels. In particular, keen attention is being focused to how the US-China trade conflict will develop in light

of the global trend toward protectionism.

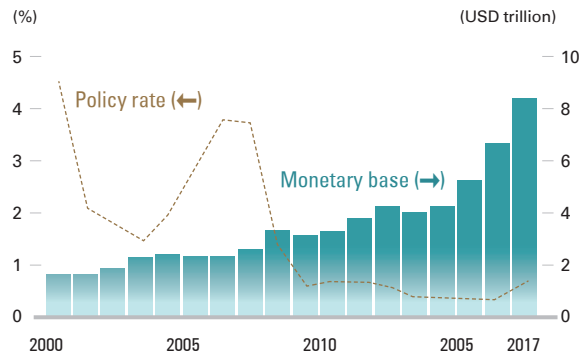
To assess whether the world economy will sustain its recovery momentum and the world trade will recover to the pre-crisis level again, it is necessary to examine the changes in the world economy during the decade after the crisis. In other words, understanding how the world economic fundamentals have changed over the last ten years is essential for predicting the market in the future and finding out whether the fundamentals have become strong enough to underpin an ongoing cyclical upturn. To this end, one question should be answered first: Is the global financial crisis over?

Is the global financial crisis over?

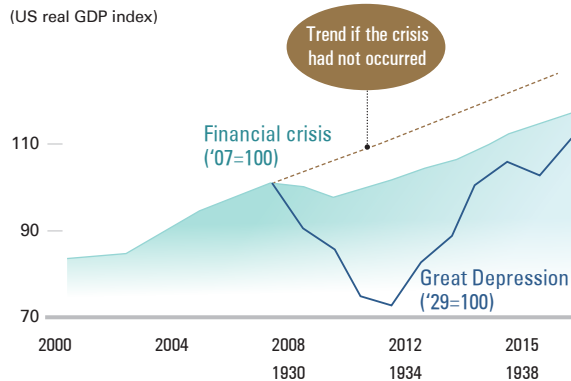
Evaluation of the past decade

To evaluate the ten years following the crisis, the causes and progress of the financial crisis should first be addressed to understand how the economy was impacted by the crisis and where the global economy currently stands.

① Causes and progress of the financial crisis: Massive economic stimulus to barely escape another Great Depression

Figure 3. Interest Rate & Monetary Base: Advanced Economies

Source: BOK

Figure 4. US Real GDP: Financial Crisis vs. Great Depression

Source: Fed

The US housing boom and surging household debt were triggered by the bursting of the dot-com bubble in 2000 and the Federal Reserve (Fed)'s reduction of the federal funds rate from 6.5% in late 2000 to 1% in 2003. During this period, mortgage lending continuously increased, and so did subprime borrowing. In addition, derivatives such as mortgage-backed securities (MBS) and collateralized debt obligations (CDO) were recklessly issued by investment banks, ballooning to the level unprecedented.

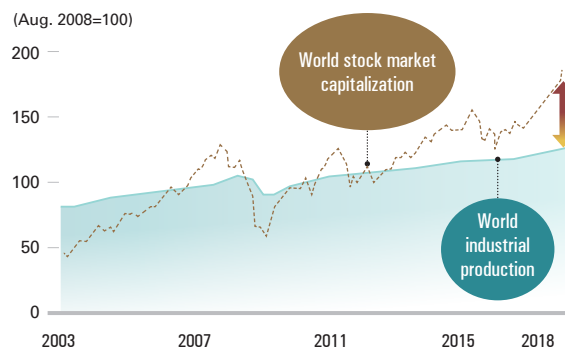
Sensing the risk, the Fed steadily raised the funds rate from 1% to 5.25% during 2004 through 2006, leading to the bursting of the housing bubble. Starting in 2007, large mortgage lenders began to declare bankruptcy. Finally, the investment bank Lehman Brothers filed for bankruptcy in September 2008, triggering a national financial crisis that soon spread throughout the globe.

Advanced countries poured massive volumes of funds into fiscal stimulus packages over the course of years to cope with the enormous financial distress equivalent to the Great Depression, and their fiscal deficits reached as far as 8% of GDP in 2010. Starting with China's RMB 4 tril-

lion stimulus plan in 2009, developing countries have also endured fiscal deficits, surpassing 4% of GDP since 2014. Over the past decade, government debts in both advanced and developing economies have increased by about USD 29 trillion.

In addition to the fiscal expansion, advanced countries pursued an unprecedented zero interest rate policy with quantitative easing. Figure 3 shows that advanced economies' monetary base increased by about USD 6 trillion and policy rates fell to near-zero levels during the last decade.

Thanks to these massive economic stimulus packages, the global economy was able to escape a shock equivalent to the Great Depression. Figure 4 compares the US real GDP growth during the ten years after the Great Depression of the 20th century with that after the financial crisis, showing how the massive stimulus plans implemented after the financial crisis, unlike the response to the Great Depression, profoundly buffered the shock. However, compared with the projected growth trajectory had the crisis not occurred, the US real GDP continued to grow at the lower rate than the projected growth and the gap between the projected trajectory and the real GDP never

Figure 5. Financial and Real Decoupling

Source: WFE, CPB

Figure 6. Persistent G2-led Trade Imbalance

Source: US Department of Commerce

narrowed. Therefore, economists have referred to the decade after the financial crisis as the “Great Recession.”

② Current status of the global economy – Financial and real decoupling and persistent G2 imbalance

There are two prominent phenomena in the global economy today: the decoupling of the financial and real sectors and the worsening of the G2 imbalance. The decoupling of the financial sector from the real economy is the result of an asset bubble following quantitative easing (QE) though the industrial growth is very sluggish. Trade imbalances between the US and China have been triggered by a global savings glut which has led to a US consumption boom.

The three phases of QE by the Fed triggered renewed stock market and housing booms, but despite the very low interest rates, the slowdown in the real economy was prolonged. The expected rate of return in the real economy plunged after the financial crisis, resulting in massive investments in stocks and real estate as well as speculative demand.

The slower recovery in the real economy, par-

ticularly in the manufacturing sector, was the aftereffect of China’s large-scale economic stimulus and excessive investment, which produced a supply glut. The debts of state-owned enterprises surged as they financed investments. In China, state-owned enterprises hold nearly 60% of total corporate debt. As China has been slow to address its supply glut, global manufacturing continues to remain sluggish. In addition, with the expansion of the manufacturing supply chain under globalization, the ripple effects of an economic recession affect the manufacturing sector more harshly than the service sector, leading to sluggishness in manufacturing. This created a phenomenon in which equity prices increased excessively while global industrial production slowed. This has given rise to a financial and real economic decoupling under which the gap between the financial sector and the real economy continues to widen, as seen in Figure 5. Nobel laureate and Yale University professor of economics Robert J. Shiller has warned that this decoupling could lead to an asset price plunge or at least a rapid correction in one or two years.

Figure 6 shows that the persistent expansion of G2-led trade imbalances is mainly attributable



to excessive US consumption matched by disproportionate savings in China. The US trade deficit caused by excess consumption is actually a net foreign capital inflow to the US, which is financed by excessive global savings. Although trade imbalances were expanding even before the crisis, the problem is that this trend still continues today. The US trade deficit against China steadily increased to about USD 400 billion and China's share of the total US trade deficit surpassed 45% in 2017.

On GDP account,

$$\begin{aligned} &\text{Low savings} \ominus \text{Budget deficit} \ominus \\ &= \text{Trade deficit} \ominus = \text{Net foreign capital inflows} \\ &(S-I) + (T-G) = (X-M) \end{aligned}$$

S: Savings, I: Investment, T: Tax revenue,
G: Government expenditure, X: Export, M: Import

The US trade deficit has increased due to over-consumption and extravagant fiscal expenditures and has been financed by net foreign capital inflows. Chinese excess savings have steadily underpinned excessive US consumption, mort-

gages, and Treasury bond purchases. Former Fed Chairman Ben Bernanke stressed that “a global saving glut is a root cause of the crisis triggered by US asset bubbles.” In this sense, it is fair to say that repeated US asset bubbles and G2 trade imbalances are connected within a single chain.

This G2 imbalance is likely to expand in the future. The Congressional Budget Office (CBO) projects the US budget deficit will reach USD 1.5 trillion over the next ten years. In this case, the US net national savings rate could fall from its current level of 2.4% to almost 0%.

③ Evaluation of the ten years after the financial crisis—Possible recurrence of a crisis due to repeated bubbles and excess debt

To compare the current global economy with economic conditions immediately before the crisis, it is first necessary to compare the levels of the bubbles that fueled the financial crisis and the levels of debt that financed such bubbles. Although financial soundness improved after the introduc-

tion of Basel III and the Dodd-Frank Act of 2010, the current level of bubbles and the balance of debt levels are surpassing those just before the crisis.

Examining the possibility of current bubbles, the US real housing price index has recently resurged to the level it had reached by the end of 2007. The S&P 500 price earnings (P/E) ratio per share was 32.5 as of August 2018, 125% of the level before the crisis. Global debt is currently at a record high, up USD 65 trillion since the crisis. Based on BIS, the debt-to-GDP ratio is 198% in emerging economies. In particular, China's ratio is almost 261%, far beyond the warning level.

Furthermore, there is insufficient capacity to emplace policy measures for coping with a possible future crisis. Because of advanced economies' record high debt-to-GDP ratio of 109% at the end of 2017 and the prolongation of low interest rates, there is limited room for interest rate cuts by the Fed or other central banks. Figure 9 illustrates how the US effective federal funds rate is now only 1.9%, less than half the historic average of 4.9%. Europe and Japan still maintain zero interest rates and are only considering raising them as late as sometime in 2019; therefore, there is no possibility of an interest rate cut.

Why the US trade deficit against China matters, and why President Trump cares too much about it

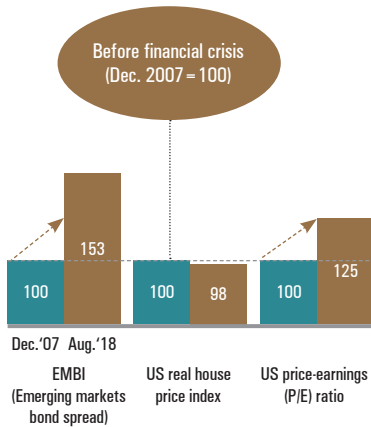
Many economists believe that the Trump administration has no need for panic over US trade deficits since the total US trade deficit has not increased compared with prior to the financial crisis. In particular, its current account deficit including the service balance has declined significantly. Their assertion is based on the US trade deficit and current account deficit trends shown in Figures 10 and 11. Ground is also being gained in the US trade deficit-to-GDP ratio.

However, one notable issue is that US trade and current account deficits against China have indeed continued to rise even after the financial crisis. The trade deficit (% of GDP) has been growing steadily despite a

slight slowdown, and the current account deficit (% of GDP) has not declined at all after the crisis. The Trump administration is pointing its finger at this. It also believes that the continuous rise in Chinese exports to the US is dampening US domestic demand and employment and causing the offshoring of US plants. In addition, the administration describes uncompensated Chinese use of US technologies and intellectual property rights as a transfer of sovereign wealth. It further asserts that excess Chinese savings flowing into the US have fueled low interest rates and asset bubbles as a result of heavy purchasing of mortgages and stocks.

If a global savings glut has caused US bubbles, as asserted by Former Fed Chairman Ben Bernanke, the persistent US trade deficit with China could cause net foreign capital inflows to continue, another source for a new crisis. Therefore, the persistence or spread of the G2 trade imbalance is sparking fears that it will spiral into a trade war, or even a new Cold War.

**Figure 7. Financial Indicator Comparison
(Before the Financial Crisis vs. Today)**



Source: BIS (excluding financial institutions)

Note: P/E ratio – 32.6 for the Great Depression (1929), 43.8 for the dot-com bubble (2000), 26 for the financial crisis (Dec. 2007), and 32.5 recently (Aug. 2018)

Figure 8. Global Debt Balance

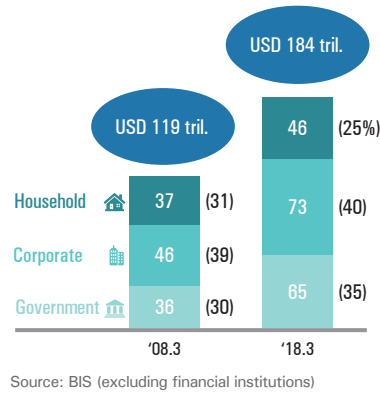
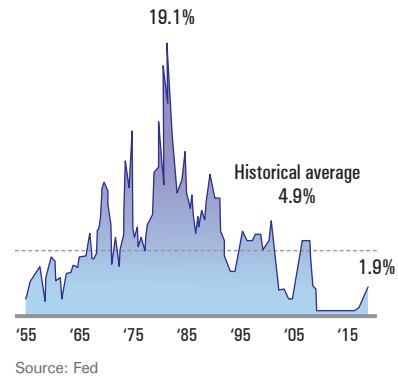


Figure 9. US (Effective) Federal Funds Rate



If President Trump achieves a second round of tax cuts and fiscal expansion, the US net national savings

rate will decline further and the US trade deficit against China will balloon, aggravating the US-China feud.

Figure 10. US Trade Deficit: Trend and % of GDP

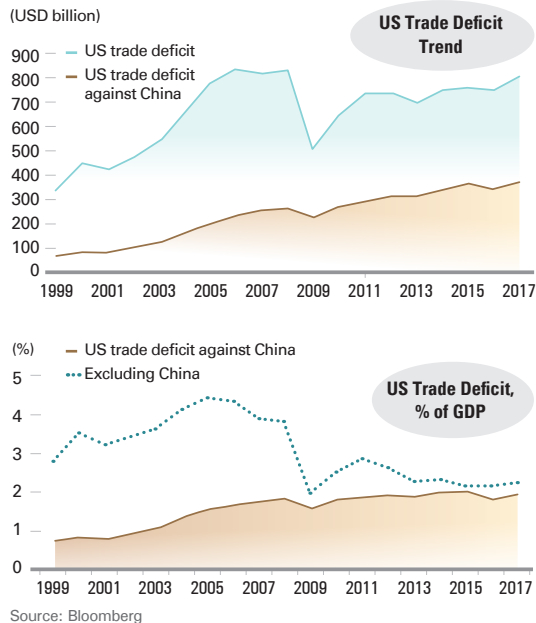


Figure 11. US Current Account Deficit: Trend and % of GDP

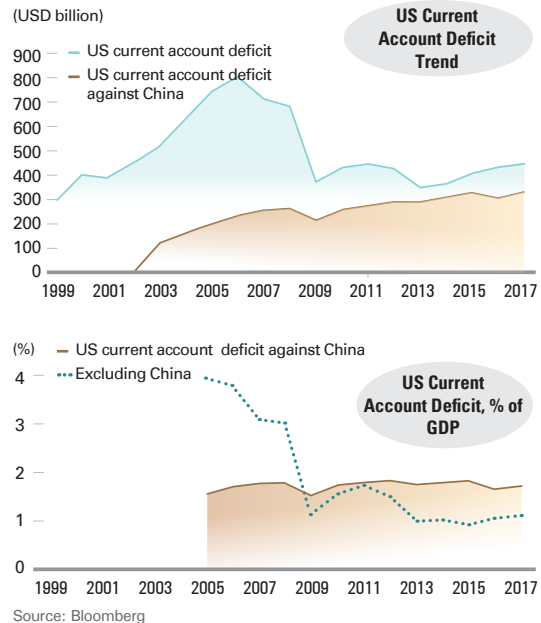
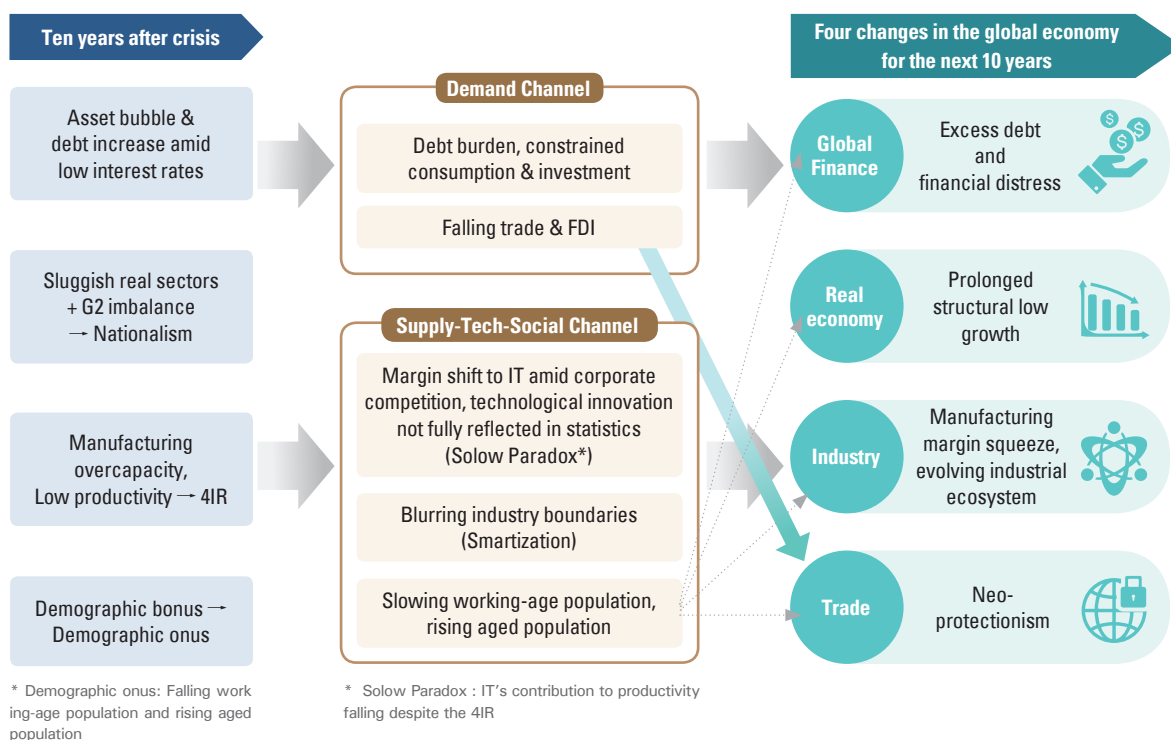


Figure 12. The Economy during the Ten Years after the Financial Crisis and Four Changes Facing the Global Economy for the Next Ten Years



Ten years after the financial crisis, the global economy will face four major changes: excess debt, sluggish real sectors, the G2 imbalance, and low productivity, and demographic onus, triggering shifts in global finance, the real economy, industry, and trade

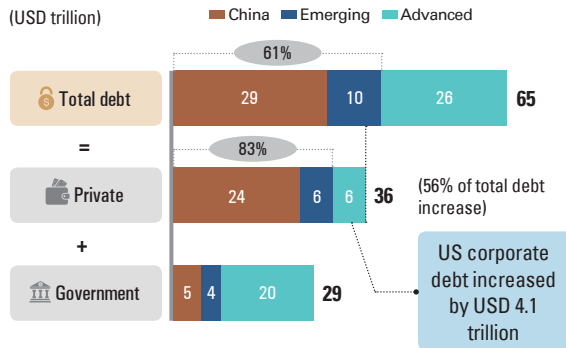
During the decade since the financial crisis, the global economy experienced four major phenomena: asset bubbles and surging debt in a low interest rate environment; a rise in nationalism triggered by the persistent sluggishness in the real economy and the worsening G2 imbalance; the Fourth Industrial Revolution stemming from ICT advancements combined with efforts to address low productivity amid excess manufacturing capacity; and a shift from a demographic bonus to a demographic onus. Not directly a product of the

financial crisis, the demographic onus refers to the fall in the working-age population while the aged population is expanding.

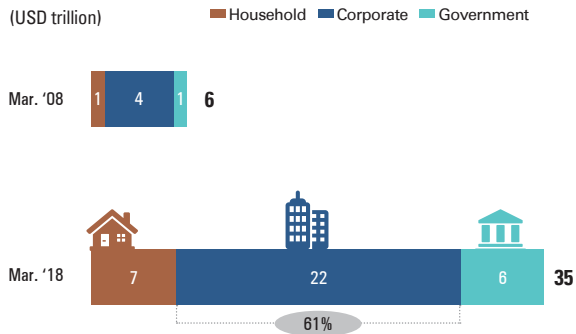
These four phenomena have served as drivers for major changes in global finance, the real economy, industry, and trade through demand channels and supply-technology-social channels.

Therefore the global economy will see these four major changes during the next decade: from a financial aspect, excess debt and financial distress; in the real economy, prolonged structural low growth; from an industrial perspective, a margin squeeze in manufacturing and evolving industrial ecosystem; in trade, the spread of neo-protectionism.

The four changes are described in detail as follows.

Figure 13. Debt Increase by Country and Debtor (March '08 vs. March '18)

Source: BIS

Figure 14. China's Debt Balance by Debtor

① First change: Excess debt and financial distress

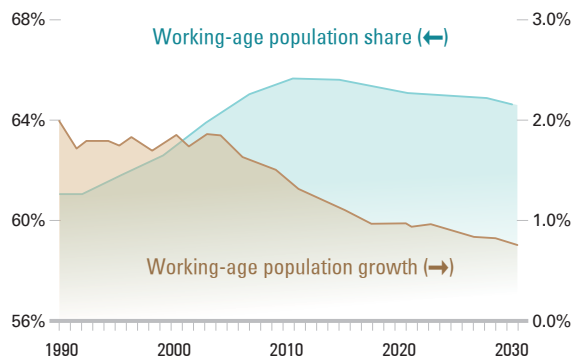
The first change is that the global economy will face excess debt and financial distress. Global debt has already reached a critical level. With the shift to monetary contraction in advanced economies, global interest rates will inevitably rise. The related risk will grow for heavily-indebted countries.

As low growth and low interest rate trends lingered after the financial crisis, global debt surged. In particular, emerging economies led the explosion in global private debt. According to BIS, global debt increased by USD 65 trillion over the past decade (USD 36 trillion in private debt and USD 29 trillion in government debt). Emerging markets accounted for 83% of the increase in global private debt. Notably, China made up a 67% share of this debt increase. Among the private debt growth in emerging economies, corporate debt totaled USD 22 trillion, mainly driven by the improvement of lending conditions under prolonged ultra-low interest rates. Meanwhile, advanced economies have deleveraged household debt to some extent after the financial crisis, but their government debt surged. Eurozone gov-

ernment bonds doubled from EUR 6.3 trillion to EUR 13.2 trillion over the ten years from 2007 to 2017.

The issue is that debt-dependent growth will face limitations with the end of the low interest rate era. The Fed has signaled two or three interest rate hikes in 2019, and the ECB plans to cease its asset purchases in late 2018 and begin to increase interest rates in 2019. If advanced economies simultaneously conduct contractionary monetary measures, global interest rate increases will accelerate and the risk for heavily-indebted economies will inevitably increase. In particular, China's debt burden has already reached a level of concern. China's total debt increased six-fold over the last ten years. What is worse, owing to expanding shadow banking and rising corporate bond issuance, the country's corporate debt is currently reaching 164% of GDP, far surpassing the global threshold of 150%.

Eurozone governments' debt-to-GDP ratio recorded 99% in late 2017, surpassing the critical level of 90%. With the rising incidence of insolvent banks in Southern Europe, including in Italy, financial instability will reappear with global interest rate increases.

Figure 15. Global Working-age Population: Share and Growth

Source: UN

Table 1. US Productivity Growth (CAGR)

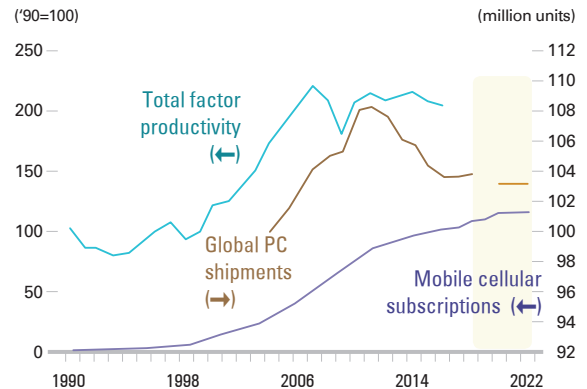
	'90s	'00~'08	'09~'16
Labor productivity	2.2%	1.9%	1.1%
Total factor productivity	0.8%	0.6%	0.1%

Source: Conference Board

② Second change: New normal of structural low growth

From the real economy perspective, the second change is that structural low growth in the global economy will become the new normal. Structural low growth does not necessarily mean a recession: It simply means that it is structurally difficult to sustain levels of consumption and investment, labor supply, and productivity as high as those before the financial crisis. Chronic demand shortfalls and the decline in the working-age population share and productivity will diminish growth.

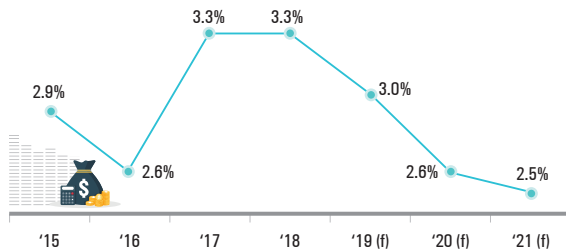
In 2013, Lawrence Summers, former Secretary of the Treasury and a professor of economics at Harvard University, contended the secular stagnation thesis referring to a phenomenon in which consumption and investment growth rates

Figure 16. ICT and Productivity

Source: Conference Board, Statista

remain low despite negative real interest rates. He asserted that sluggish demand, particularly excess savings over corporate investment, was the main cause of the prolonged global economic recession. He has recently asserted that his argument is still pertinent today. Considering the low interest rates and excessive debt we are currently experiencing, the burden of debt deleveraging will inevitably increase during this rising trend for interest rates. This is expected to stifle household consumption and corporate investment. The global trend in employment stagnation and falling labor income share is another cause of the structural consumption decline. Based on various forecasts by leading institutions, fixed investment growth rate will continue to fall from the 4% range before the crisis to just above 3% annually in the middle of 2020s.

On the supply side, the slowing growth in the working-age population and low productivity will serve as factors dragging down potential growth. Working-age population growth has declined since the mid-2000s. The share of the

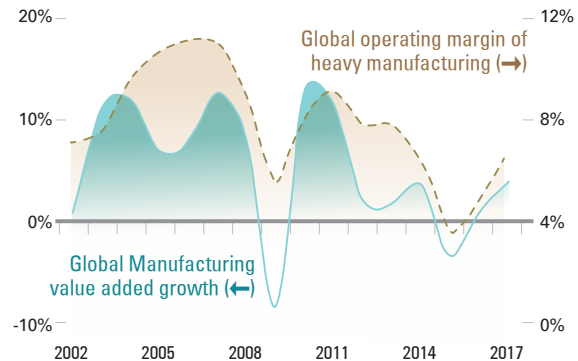
Figure 17. World GDP Growth

	2000s	2010s	2020s
Advanced economies	2.1%	1.9%	1.5%
Emerging economies	6.2%	4.8%	4.5%

Source: POSCO Research Institute(December 2018)

working-age population within the overall global population began falling in 2012, and this trend will continue for a long time to come. In addition, productivity decline and unaddressed overcapacity could serve as a hindrance to growth. US labor productivity and total factor productivity growth have continued to fall, particularly after the financial crisis. Since total factor productivity is a measure of technological progress, a decline in this indicator means that the effects of increasing productivity diminish as the distribution of computers, smartphones, and the internet approaches saturation. The contributing effects of the Fourth Industrial Revolution on productivity have not yet become clear. This is referred to the Solow Paradox, the perception that IT technology takes time to be reflected in productivity. This suggests that it could take a considerable time before the Fourth Industrial Revolution is reflected in productivity statistics.

Furthermore, overcapacity, which has not yet been addressed, is also restricting the expansion of investment. For example, China's industrial

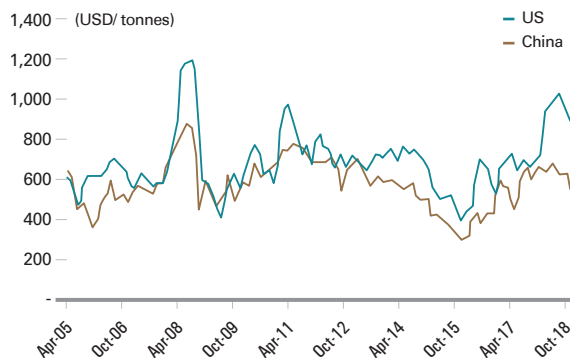
Figure 18. Manufacturing Value Added and Operating Margin

Source: World Bank, S&P

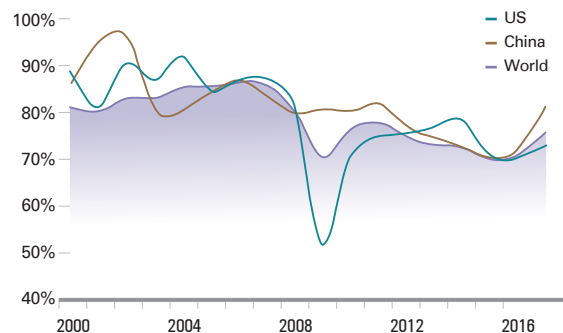
operating rate was about 90% on average before the financial crisis; despite the recent recovery, the rate is still hovering below 80%. By all accounts, global economic growth is expected to fall with the weakening of growth momentum, and the global economy is likely to enter an era of structural low growth. More specifically, after peaking at 3.3% in 2018, global GDP growth (based on market exchange rate) is projected to decline to 3.0% in 2019 and to the 2% range in the 2020s. A slowdown in economic growth is expected to occur in both developed and developing countries.

③ Third change: Manufacturing margin squeeze and evolving industrial ecosystem

The third change is a margin squeeze and shifting industrial ecosystem for manufacturing. As seen in Figure 18, the margin squeeze in manufacturing worsened after the financial crisis as profitability declined under the fierce competition and a falling operating rate resulting from sluggish demand.

Figure 19. US and Chinese Domestic HR Coil Prices

Source: Bloomberg

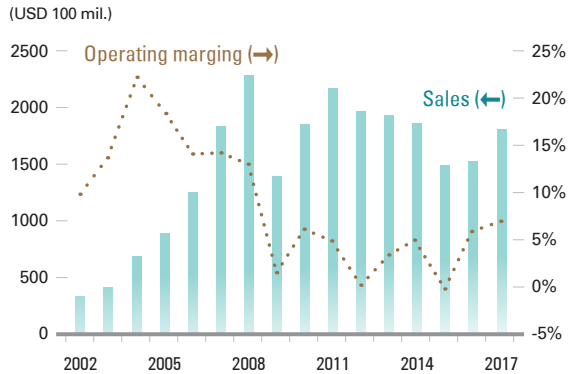
Figure 20. Capacity Utilization Rate of the Steel Industry

Source: OECD, Worldsteel

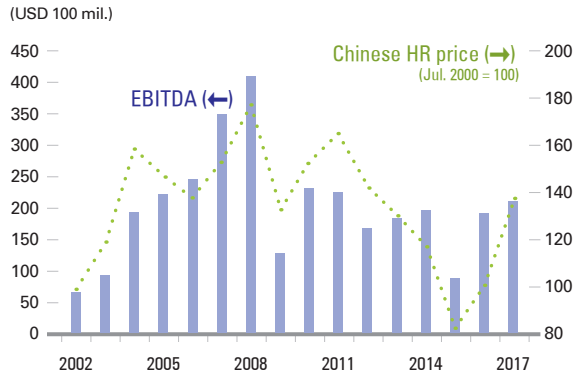
In manufacturing, the steel sector was most affected by the shock of the financial crisis. Bolstered by investment-driven rapid growth in China before the financial crisis, steel demand rapidly increased and investment and production capacity in the global steel industry surged. However, with the plunge in global steel demand after the financial crisis, steel prices plummeted and so did the operating rate. For instance, US domestic hot-rolled coil prices (spot) fell from USD 1,185 in August 2008 to a mere USD 411 in 2009. After a series of fluctuations, it hit a bottom of USD 390 in December 2015 and began rising. China's domestic HR coil prices shared a similar trajectory, but the gap between the US and Chinese prices has been widening since October 2017, likely due to the distinct economic conditions in the two countries as well as to the decline in steel imports under US tariffs on steel imports. In the meantime, the capacity utilization rate for the global steel industry stood at 84.9% in 2007, fell to 69.4% in 2009, and rose slightly to 74.9% in 2017. Despite the recent recovery, the operating

rate has still not reached pre-crisis levels.

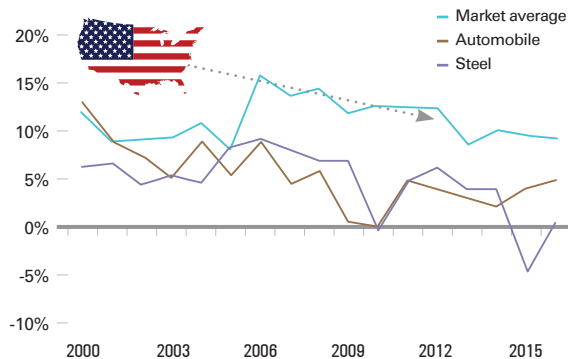
As the decline in steel prices and capacity utilization rate led to falling sales and profitability, steel companies experienced unprecedentedly poor performance. The performance of the top five global steel companies—ArcelorMittal, Baowu, Hebei, NSSMC, and POSCO by worldsteel standards—mirrors the overall performance of the global steel industry. The global Big 5's sales declined until 2015 after a crest in 2008. They were recovering from 2016, but failed to reach the pre-crisis level. Their sales for 2017 remained at 79.3% of the 2009 level. In addition, their average operating margin before the crisis was a whopping 22.4% in 2004 and 13.1% in 2008, but nosedived to 0.1% in 2012 and even to -0.3% in 2015. Thanks to a recovery in the steel market afterwards, the average operating margin rose to 7.0% in 2017, but still remained far below the pre-crisis level. Furthermore, the steel industry is facing a prolonged trend in which the operating margin remains well under the manufacturing average. This is because the steel industry's over-

Figure 21. Top 5 Steelmakers' Sales and Operating Margin

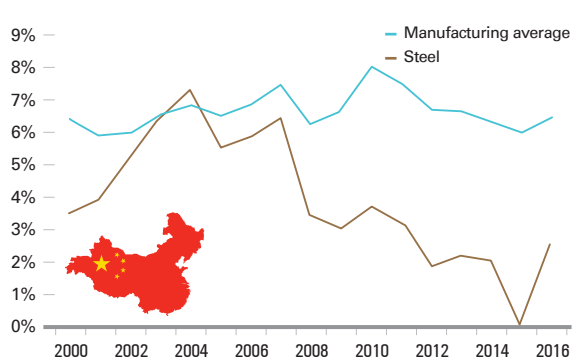
Note: Based on worldsteel data on the separate accounting-based performance of the global top five steel companies in '17 (ArcelorMittal, Baowu, Hebei, NSSMC, and POSCO)

Figure 22. Chinese Steel Prices & Top 5 Steelmakers' EBITDA

Source: Bloomberg

Figure 23. US Operating Margin by Industry

Note: After-tax basis
Source: Damodaran online

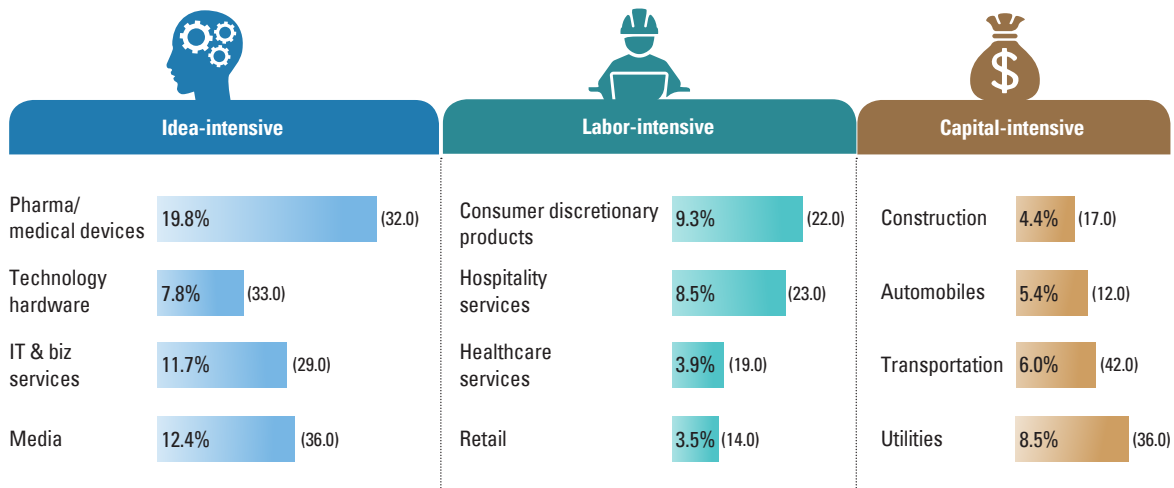
Figure 24. China's Manufacturing Operating Margin

Note: Based on medium-to-large companies
Source: NBS

capacity rate is among the highest in all manufacturing. The decline of operating margins seen in both steel and manufacturing is prevalent across all industries. McKinsey predicts the operating margin for companies worldwide to fall continuously over the long term. According to a McKinsey report, global companies' net-profit growth showed a CAGR of 5.1% over 1980-2013, but is expected to drop to a CAGR of 1.2% for

2013-2025. The first cause of the decline in net profit growth is increased costs. While labor costs have increased owing to rising minimum wages and slowing working-age population, corporate costs will increase as interest and corporate tax rates rise with the expansion of government fiscal expenditures and bond issuance. Second, with the emergence of developing economies such as China and India, global competition will

Table 2. Profit Margin by Industry



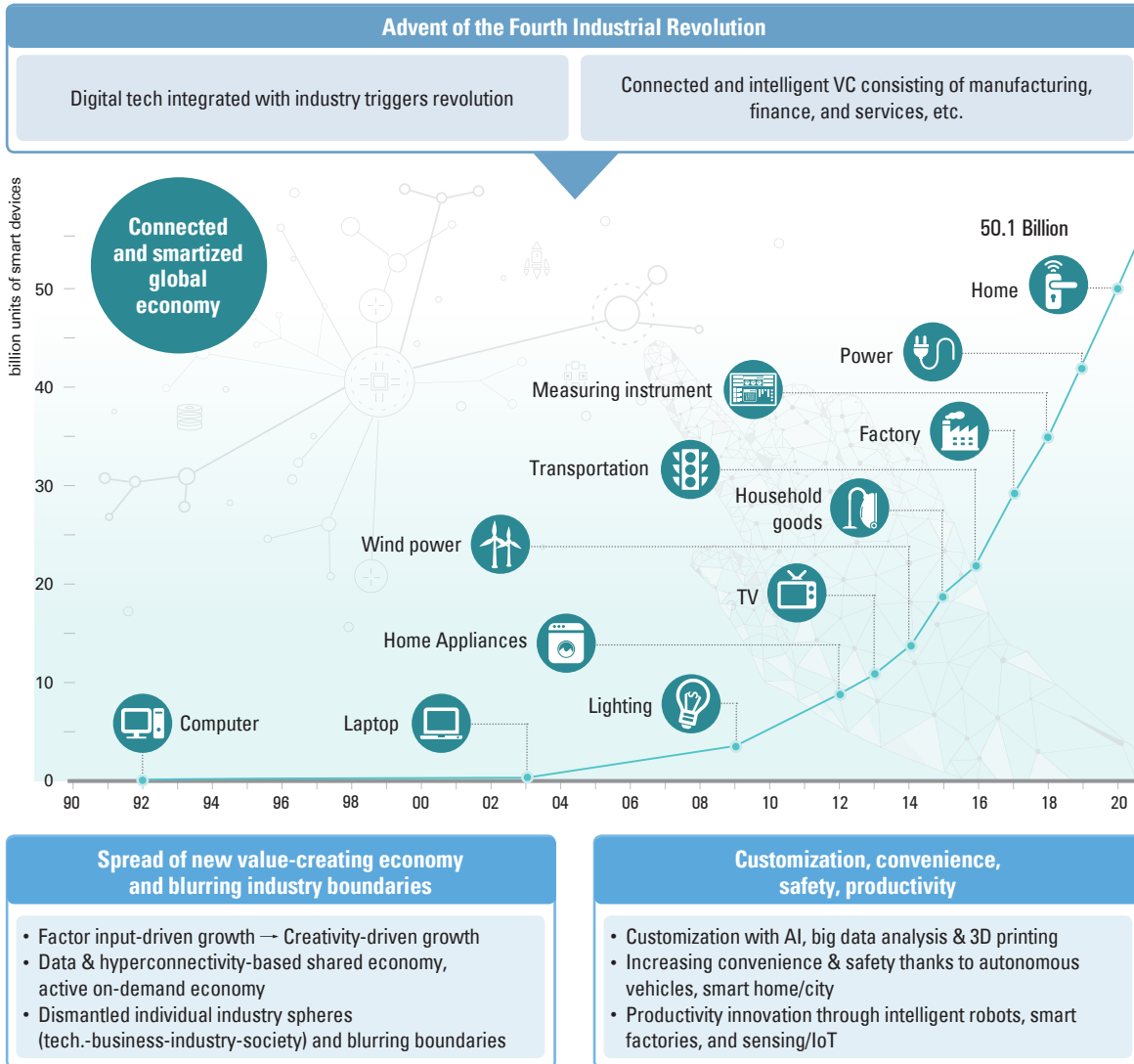
Note: For listed companies with annual sales of more than \$ 200 million for '90-'13, () refers to margin spread (%p)
Source: McKinsey

become fiercer than ever. Multinational companies in emerging economies can pursue growth over profitability under strong government support, so they can encroach on the conventional markets traditionally dominated by global firms. Third, profit margins are being shifted from traditional manufacturing to idea-intensive industries, including pharmaceuticals and medical equipment, IT and business services, and media.

With the advancement of the 4IR following the financial crisis, the ecosystem is rapidly evolving to a digital-based version using ICT and market opportunities will subsequently increase. Competition for standardization and ecosystems is intensifying among countries. Germany released its Industry 4.0 strategy in 2012 to stake an early claim to the 4IR, and the USA announced its Advanced Manufacturing Initiative in 2013. In

2015, China also released its Manufacturing 2025 program to sophisticate manufacturing through a convergence of IT and manufacturing.

As the 4IR progresses, smart technology-based big business is anticipated to rise in emerging economies. The smart factory market, which provides customer-tailored production and services by integrating IoT with value chains, is expected to grow at a CAGR of over 10% in emerging economies and over 5% in advanced economies for next decade. In addition, there will be increasing opportunities from smart logistics, smart cities, and smart energy. McKinsey estimates that emerging economies' demand for smart network infrastructure, including roads, ports, communications, electricity, and water resources, will increase by USD 2 trillion annually by 2035.

Figure 25. Smartization Spreading to Economy and Industry under the 4IR

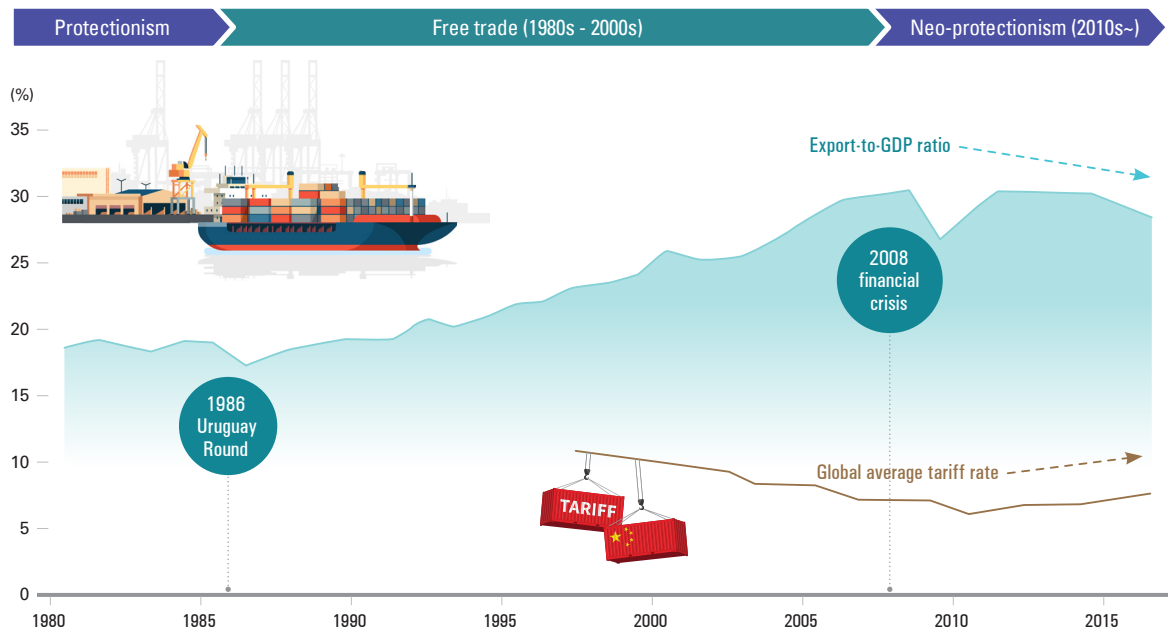
Source: CISCO, POSRI, POSCO Research institute

④ Fourth change: Neo-protectionism

The fourth change is the spread of neo-protectionism. Under the widespread environment of globalization that prevailed before the financial crisis, the contribution of exports to global GDP continued to expand and the average global tariff

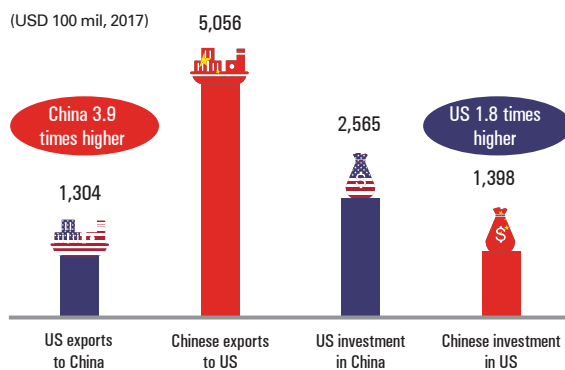
rate declined. However, as prolonged low growth and protectionism spread after the financial crisis, this trend reversed. US President Donald Trump is spearheading the movement to raise trade barriers through his “America first” stance, and free trade regimes are feared to be at great

Figure 26. The Rise of Neo-protectionism after the Financial Crisis



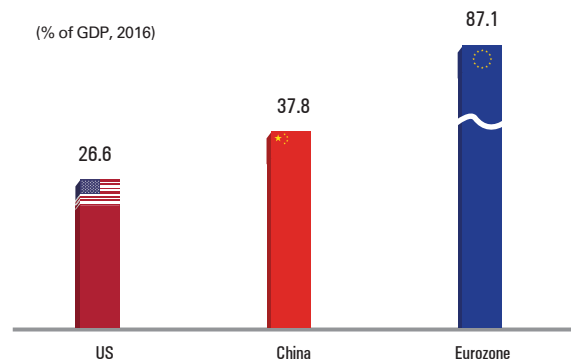
Source : World Bank, POSRI

Figure 27. US-China Bilateral Trade and Direct Investment



Source : KITA, The US-China FDI Project

Figure 28. Trade Dependence



Source : World Bank

risk. The ongoing US-China trade war is a hegemonic struggle that is highly likely to persist. President Trump appears to believe that he holds bargaining power in the US-China trade talks since in 2017 US imports from China (USD 505.6

trillion) were nearly quadruple US exports to China (USD 130.4 trillion). The US announced tariffs on USD 250 billion worth of Chinese imports in July and September 2018, and on another USD 267 billion worth of imports if China takes retal-

iatory measures. If this is realized, the US tariffs on Chinese imports will be equivalent to China's total exports to the US in 2017.

The US will strategically continue "China bashing" in its trade conflicts with the country. US pressure on China is aimed at making the most of trade issues to call for the opening of Chinese financial markets and protection of intellectual property rights. As China will not easily give in to US requests, negotiations are not expected to be simple and the US-China trade war is highly likely to escalate to a game of chicken that endures for some time. In the worst-case scenario, the two countries will maintain their harsh stance toward each other without compromise and face a head-on-collision. In this situation, the greatest victims would be themselves. There is also the possibility that the trade war could spread into a financial war. The IMF predicts a decline in GDP growth under a pessimistic scenario in which an additional 25% tariff is levied on cars imported into the US from China in addition to the existing tariffs and risk premiums increase. It turns out that the US would be affected more harshly (-0.8%p) than emerging countries (-0.7%p), Latin America (-0.6%p), and the Eurozone (-0.3%p). Furthermore, if the US continues to threaten to label China a currency manipulator, the war could spiral into a slugfest: China could depreciate the yuan and sell off its huge holdings of US Treasury bonds. As of August 2018, China's holdings of US Treasuries recorded USD 1.17 trillion, down by USD 366 billion compared to one year earlier. However, China remains the world's largest holder of US Treasury bonds.

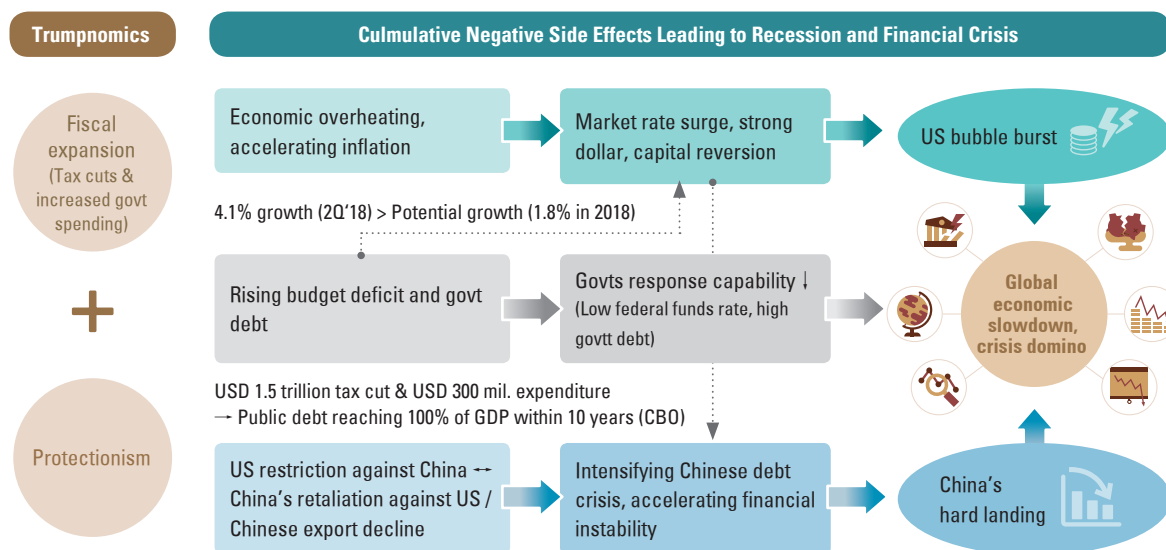
A possibility of the next economic crisis

The changes in the global economy reviewed so far are not basically assumed in a crisis scenario. However, given the current global economic conditions, another crisis cannot be ruled out. When and how could the next economic crisis occur? One plausible scenario would be a G2-led economic crisis in the next couple of years. The Trump administration's economic policies could result in an overheated economy and interest rate surge, causing a global bubble to burst with a consequent debt crisis.

Trumponomics is characterized by fiscal expansion and protectionism. If stimulus including a USD 1.5 trillion tax cut and USD 300 billion fiscal spending increase continue in this already overheating economy, inflation will increase and inevitably accelerate the pace of interest rate increases. In projections by the Congressional Budget Office (CBO), potential US GDP growth is 1.8% in 2018, but real GDP growth recorded 4.2% in the second quarter of 2018 and the unemployment rate fell to a 49-year low of 3.7%, already showing signals of economic overheating. The US consumer price index is hovering above the Fed's 2.0 percent inflation target. If inflation accelerates, market interest rates are bound to surge. In this case, the stock market and housing price bubbles will rapidly burst. If asset bubbles collapse while government debt is skyrocketing and benchmark interest rates are low, government crisis management may be limited.

Furthermore, if interest rates increase during a situation in which China's exports plunge amid a G2-led trade conflict and the debt crisis inten-

Figure 29. G2-led Economic Crisis: Possibility and Transmission



Source : POSCO Research Institute

sifies in China, there is a possibility of a hard landing for China. If this G2-led crisis spreads to highly-indebted and export-driven emerging economies, it could bring about a considerable shock. “The stimulus is going to hit the economy in a big way this year and next year, and then in 2020 Wile E. Coyote is going to go off the cliff,” said former Fed chairman Ben Bernanke. Nobel laureate and Harvard economist Martin Feldstein also stated that “the US asset price is very close to a bubble. The real interest rate is negative and the Fed should have started raising interest rates a few years ago.” This means that the US economy may boom for a while, but it is unsustainable.

Forecasting three major economic variables: interest rates, the value of the dollar, and oil prices

There are three economic variables that greatly affect both national economies and corporate

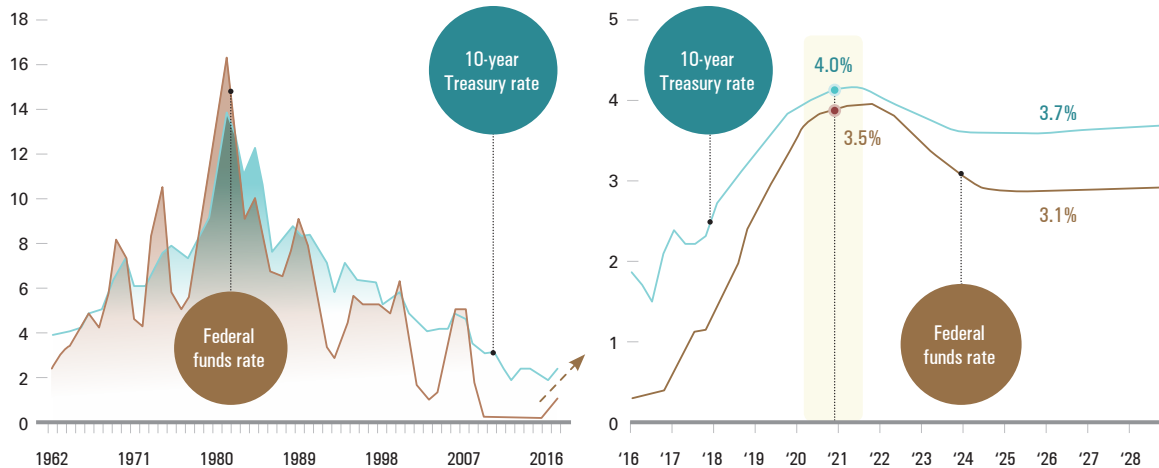
management: interest rates, foreign exchange rates, and oil prices. This article examines trends and characteristics in these three variables and suggests mid-to-long term forecasts.

❶ The end of the ultra-low interest rate era during the past ten years after the financial crisis

The Fed maintained a zero interest rate policy long since the financial crisis. However, with the clear signs of a US economic recovery, it began to normalize monetary policy and raise federal funds rates from December 2015. After nine rounds of interest rate hikes in the three subsequent years, the US federal funds rate stands at 2.25~2.5% as of December 2018. In the future, the Fed is expected to continuously raise interest rates considering the overheating US economy and growing inflation pressures. The fed is expected to raise interest rate two or three times

Figure 30. US Interest Rates: Trend and Projection

(%) * Long-term rate : 11% ('80s) → 7% ('90s) → 4% ('00s)



Source: CBO, Bloomberg

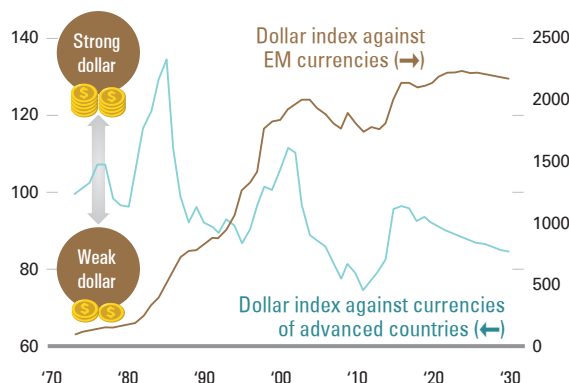
more in 2019. Consequently, the US federal funds rate is projected to rise to 3.25~3.5% by 2020, and the interest rate of 10-year Treasury bonds will also show an upward trend. Despite these short-term rate hikes, the rate is expected to stabilize in the mid-to-long term since the Fed is expected to cut the federal funds rate due to an economic downturn after 2020. Taking into account potential GDP growth and inflation pressures, the equilibrium interest rate is projected to be somewhere around 3% after 2020.

② The value of the dollar: Strong during interest rate hikes but weak in the mid-to-long term

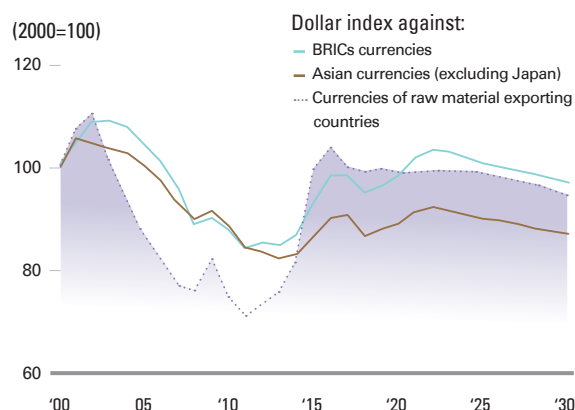
The US dollar is likely to remain strong during the period of rising interest rates, but should weaken in the mid-to-long term as the economy enters a downturn and the interest rates stabilize. The strong dollar against other major currencies in the short term can be attributed to the fact that

US interest rate increases will lead to the appreciation of the dollar against the euro and yen. Another reason is the increasing demand for dollars as a safe asset with the spread of US-led protectionism.

However, factors that depreciate the dollar will become more prominent in the mid-to-long term with the narrowing of the GDP gap among countries with a US economic slowdown and accumulating US current account and fiscal deficits. Within one or two years, the dollar is projected to hold strong against emerging market currencies because of capital flight from these economies following US interest rate hikes and the tendency for investors to avoid risky assets. In the mid-to-long term, global capital inflows will intensify into emerging markets as they stabilize and their domestic markets expand, meaning emerging market currencies against the dollar will strengthen.

Figure 31. Value of US Dollar: Trend and Projection

Source: Estimated by POSRI based on data from BIS and Federal Reserve Bank
 Note: Seven advanced economy currencies (Australia, Canada, EU, Japan, Sweden, Switzerland, and UK) and 17 emerging market currencies (Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Israel, South Korea, Malaysia, Mexico, the Philippines, Russia, Saudi Arabia, Singapore, Taiwan, and Thailand)



Note: BRICs currencies (Brazil, Russia, India, and China), Asian currencies (China, Hong Kong, Indonesia, South Korea, Malaysia, the Philippines, Singapore, Taiwan, and Thailand), and raw materials currencies (Australia, Canada, Sweden, Brazil, Chile, Colombia, Russia, and Saudi Arabia)

Figure 31 shows the relative value of the dollar against six advanced-market currencies—the

euro, Japanese yen, UK pound, Canadian dollar, Swedish Krona, and Swiss Franc. The dollar index

Development of the Dollar Hegemony under the Bretton Woods System and its Future

With the victory in World War II, the US emerged as the next global economic power succeeding the Great Britain. This US-led global economic order has been called the Bretton Woods system after 44 Allied nations signed an agreement supporting the international monetary system at the United Nations Monetary and Financial Conference in Bretton Woods, New Hampshire in July 1944. The Bretton Woods system of fixed exchange rates was established as a gold exchange standard to promote free trade and economic growth in the post-war world. To this end, they created the In-

ternational Monetary Fund (IMF) to provide countries in need with reserve currencies and the International Bank for Reconstruction and Development (IBRD) to support the reconstruction of war-torn countries and growth in developing countries. With the advent of Bretton Woods, the US gained the status as a reserve currency country and the tremendous benefits that accompany this status. Seigniorage, or inflation tax, refers to the profit that a central bank or a government earns from printing money (value of money – cost to produce it). As a reserve currency country, the US has enjoyed the seigniorage effect through which the inflationary shock of printing dollars is absorbed by the whole world.

However, the Bretton Woods began to falter in the 1960s with the chronic issues with international liquidity and falling dollar credit and was at the point of collapse when the US suspended dollar-gold convertibility in

in general terms refers to this index. After the US terminated the convertibility of dollars into gold in 1971, flexible exchange rate system against dollar began making the dollar still a reserve currency in 1973. The dollar index (1973=100) has been demonstrating a downward trend for the following 45 years. It has not declined continuously, however, with the value of the dollar undergoing three large upsurges. After a series of interest rate increases under the recent contractionary monetary policies, the dollar is expected to peak in one or two years and resume its decline afterward.

Just like the general dollar index, the dollar index against emerging market currencies measures the relative value of the dollar against the

currencies of 17 emerging markets, including China, Brazil, India, and South Korea. After the shift from a fixed exchange rate system to the floating exchange rate system in the 1980s-90s, emerging economies' nominal currency values have been rapidly depreciating, indicating that the value of the dollar was relatively high. As the dollar is anticipated to remain strong under the Trump administration, emerging market currencies are projected to remain weak, but they should gradually turn strong after 2019 when US interest rate increases are suspended.

③ Oil prices to be volatile in the short term but be stable in the long term

Following volatile movement amid temporary

1971. The root cause for the breakup of the Breton Woods was the excessive printing of dollars to finance the Vietnam War (1955-1975) and new social spending. In 1973, major currencies began to float against dollar depending on market supply and demand. With persistent global demand for dollars, the US was able to maintain its status as a reserve currency country despite the fluctuating value of the dollar. As seen in the graphs

below, the US has mostly had both the current account and budget deficits since the 1970 and financed these deficits by printing Treasury bonds, leading to a ballooning of public debt. As foreign governments and institutional investors bought such bonds, the US was able to maintain its interest rate relatively low and keep financing its deficits.

Foreign governments have played a role in financing

Figure 32. US Current Account Balance and Budget Balance

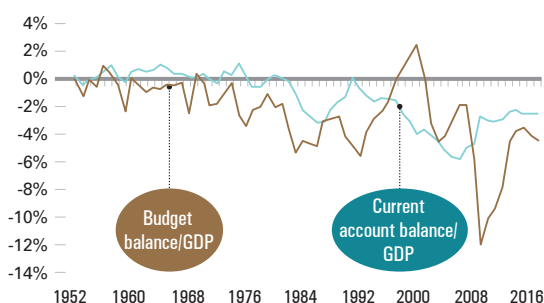
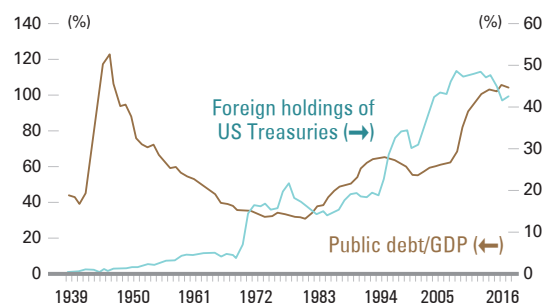


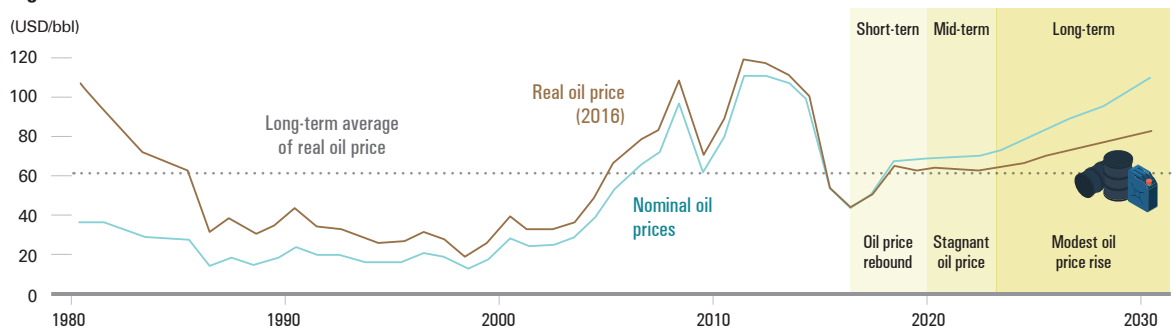
Figure 33. US Public Debt and Foreign Holdings share of US Treasuries



supply shortages and Middle East tensions, oil prices are expected to stabilize over the medium-to-long-term, influenced by the rise of alternative energy sources. Global oil prices plummeted from August 2014 to early 2016 before returning to an upward trend. The rise in oil prices since 2016 was attributable to supply shortages following production cuts and geopolitical risks in the Middle East. In the persistent environment of low oil prices following 2014, investments in oil exploration and production contracted, shale oil production slowed, and OPEC cut production, leading

oil prices to rebound over the last two years. Furthermore, concerns about security in the Middle East after the US exit from the Iran nuclear deal drove up oil prices. However, in the mid-to-long term, oil prices are expected to stabilize or rise only moderately because of an increase in the supply of oil, especially shale oil. With prices hovering around the break-even price of shale oil (USD 40-60), its production is expected to rise. With the maturation of alternative energy, crude oil consumption is projected to grow slowly at just above 1% annually in the long term. In this

Figure 34. Oil Price Forecast



Note: Consumption, production, and prospects by utilizing time lag energy between crude oil production and consumption)
Source: BP, EIA, POSCO Research Institute

the US deficits as they accumulate dollars that their companies receive for exports to the US and buy the US Treasuries considered to be highly liquid and the world's safest asset. In 2017, foreign owners accounted for 42.4% of US treasuries, and the largest holder was China. In August 2018, China's Treasury holdings marked USD 1.17 trillion, or 18.5% of total US Treasury holdings owned by foreigners.

Will US dollar hegemony continue in the future? This depends on whether the dollar will be able to maintain its value as a trading currency and a safe asset and upon the speed of the rise of competing currencies that threaten the dollar hegemony. In fact, the US dollar

index, which measures the value of the dollar against a basket of advanced currencies, is showing a similar trajectory to the US share in global GDP. This means the value of the dollar has been closely related to the standing of the US economy. The US GDP as a share of world GDP indicates a downward trend over the mid-to-long term, so did the value of dollar. As the US share of world GDP is generally projected to shrink, the value of the dollar is also anticipated to decline. In that case, how quickly can alternative currencies rise to threaten the dollar? In conclusion, alternative currencies is showing a modest rise, so it will take considerable time until they could threaten the status of dollar. For example, the

case, oil prices are highly likely to show only modest growth, staying far below pre-crisis levels.

Two challenges sparked by the structural changes of the global economy

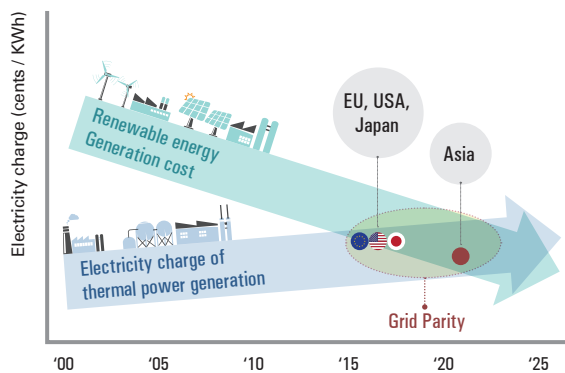
As described earlier, the global economy is expected to undergo structural changes in the real economy, finance, trade, and industry. The manufacturing industry, including the steel sector, should prepare for two challenges resulting from these major structural changes.

First, there is the structural slowdown in the

global economy. In our projections, the global economy will end its recovery and enter a period of economic adjustment in 2019. In particular, the mid-to-long term growth momentum is highly likely to remain at a structurally low level. CEOs around the world concur with this viewpoint. According to a survey conducted by McKinsey in early 2018, a number of global CEOs responded that an economic correction or slowdown should come within three to five years.

The second issue is the rise and diffusion of the Fourth Industrial Revolution (4IR), through which the manufacturing industry is trying to overcome low global economic growth. The 4IR, which started in advanced economies and has been spreading further into a wider arena, offers both challenges and opportunities. The unprecedented changes in steel-consuming industries, for example, electric vehicles, smart cities, and renewable energy are progressing rapidly in terms of both quality and quantity, and customer needs are increasingly sophisticated. In response, the steel industry must take a more agile approach to

Figure 35. Renewable Energy Grid Parity



currency composition of foreign exchange reserves in 2017 shows that the dollar still held the lion's share with

62.7%, followed by the euro (20.2%), yen (4.9%) and pound (4.5%). The share of the yuan was only 1.2%.

Figure 36. Dollar Index and US Share in Global GDP

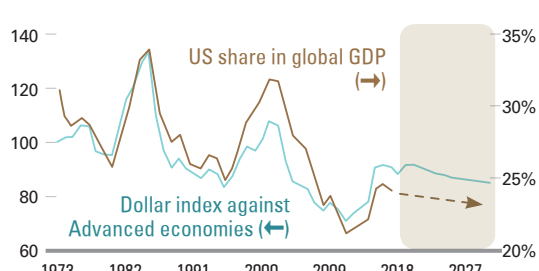


Figure 37. Composition of Foreign Currency Reserves

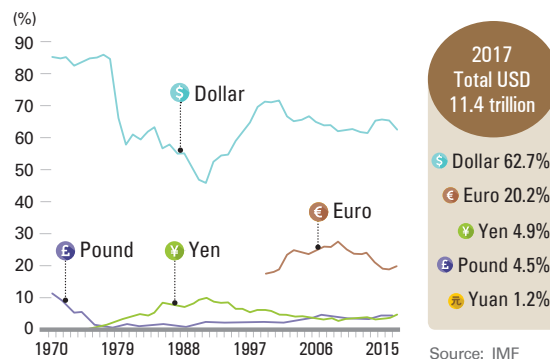
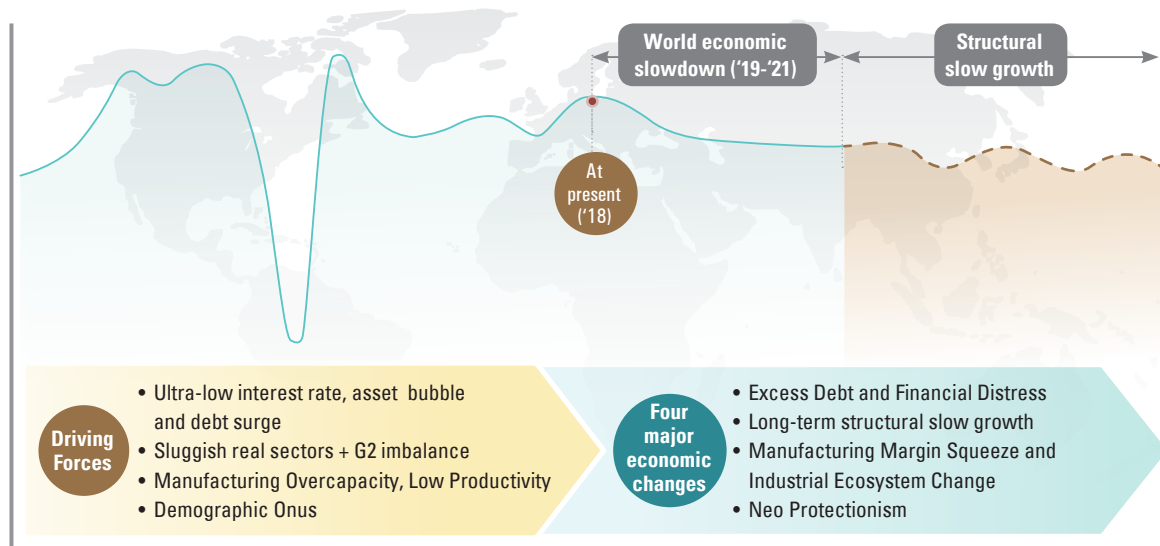


Figure 38. Global Economic Cycle and Trend Forecast



Note: The line and dots are global GDP growth and forecasts, respectively.
Source: POSCO Research Institute

its production process and technology, product mix, and services.

If it fails to respond to these two challenges appropriately, companies could face various difficulties. This is the reason why companies have to make haste to prepare for their survival and sustainable growth.

Risk management and prudential investment to cope with economic slowdown

Top management should pay keen attention to risk management as it copes with a global economic slowdown. With the deepening margin squeeze and its rising volatility, manufacturing companies could face a risk of bankruptcy due to a cash and credit crunch. As key economic variables, including economic growth, interest rates, foreign exchange rates, and oil prices, could directly impact corporate performance, CEOs must emplace systems to regularly monitor management risks and ensure a prompt response.

Siemens' risk management system provides

a good example. Siemens maintains a Risk and Internal Control (RIC) department at its headquarters. This department distributes a checklist on various risks to business sectors and regional corporate units. The checklist is divided into four categories—strategic, operations, finance, and compliance—each of which features detailed sub-items. Business sectors and regional corporate units use this checklist to monitor risk and are required to report any items with high risk scores to headquarters. Risk reporting involves the evaluation of the probability and impact of risks and the outcomes are scored as high, medium, or low. The RIC department regularly assesses whether business sectors and regional corporate units are properly monitoring risks and jointly take measures on factors that are identified in the scoring process as high risks.

In an economic downturn, operating profit declines and cost burden increases, leading to a worsening of the overall financial structure. Therefore, a company should take a conservative

stance on its investment policies and follow the “cash is king” strategy. As cash inflows decline under worsening external conditions, enterprises must be conservative in their cash-out management. One key strategy is the adjustment of investment priorities. In a highly volatile environment, enterprises should pursue a prudential approach to new business and major investment. If new business must be done, it must be closely examined and implemented in phases. It may become necessary to introduce a real-option approach.

Smart manufacturing and new product mix in preparation for the 4IR

Enterprises must prepare carefully for the Fourth Industrial Revolution. As conventional business opportunities, such as telecommunications, building construction, urban facilities, logistics and energy are integrated with ICT, the smart infrastructure market in emerging economies will continue to grow. Many research institutes are supporting this modest quantitative growth through long-term forecasting. McKinsey estimates that smart infrastructure demand in global markets will increase by USD 2 trillion annually by 2035. POSCO Research Institute is predicting that steel-consuming industries such as automobiles including EVs, new shipbuilding, and smart cities are likely to show modest but persistent growth. In terms of quality, their needs for steel will become more stringent and sophisticated. The steel industry should develop new products that satisfy needs for high strength and toughness, high corrosion resistance, and high-performance steel. For example, for automobiles, giga-pascal AHSS is required for lighter cars, heat-resistant stainless steel for exhaust systems, and high efficiency hyper NO for EV motors. In

shipbuilding and energy, there is demand for high strength and low-temperature tolerant steel for deep sea and polar exploration, sour-resistant steel for extreme conditions, and thick plate for offshore wind towers. Construction will call for high strength steel for skyscrapers and super-long span bridges and high-performance steel for interior/exterior building applications.

Furthermore, the production process requires innovation to suit customer needs in the Fourth Industrial Revolution era. The steel industry must take a smartization approach by integrating the conventional production process with ICT. Smartization in the production process means that plants can learn by themselves how to produce customized products beyond simple automation. Next, it must move from smart manufacturing to the smartization of value chains consisting of suppliers, partners, and customers. With the advancement of the 4IR, the competitive advantage of smartization will exert a strong market power. Smartization that provides differentiated goods and services will lead to an overwhelming productivity increase and become a key success factor that boosts market dominance in an increasingly fierce market. In addition, collaboration with partners is of great importance in the 4IR era. Collaborative ecosystem is emerging as a new growth engine. Using joint research with global enterprises, it will be necessary to create new business opportunities. This is why advanced countries leading the 4IR are working on the smartization of the ecosystem through public and private partnership. As a means to cope with a period of structural low growth, companies should build a collaborative ecosystem through alliances with conventional businesses in order to increase competitiveness and establish a revenue model that creates value. 🌐