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Inflation Uncertainty will Reduce the World Economic Growth

 Avoidance of economic fragmentation and transparency in monetary policy are essential —

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≺Summary≻

High inflation is occurring worldwide. Shortages in the supply of components and the disruption of distribution networks are continuing, and prices of consumer goods are rising significantly. Concerns about fossil fuel supply shortages due to decarbonization and Russian sanctions are also pushing up prices, especially for energy. In the U.S. and other countries, service prices are also rising, and higher wages due to labor shortages are being reflected in prices.

If the supply-demand crunch persists, high inflation could become the norm and the amplitude of fluctuations in inflation rates could increase. Attention needs to be paid to the following two factors, which raise the amplitude of inflation rate fluctuations: The first is the retreat of globalization. Narrowing procurement options due to the fragmentation of economic spheres and other factors will lead to more intense supply-demand fluctuations, and stagnant competition among firms will make it easier for cost fluctuations to be passed on to prices. The second is that the policy stances of central banks are unclear. During periods of high inflation, central banks are more likely to face a tradeoff between the real economy and inflation, and there may be more occasions when inflation stabilization is put on the back burner out of concern for the economy.

The concern is that greater volatility in inflation rates will reduce economic growth rates. There are two possible paths to this: 1) a path that makes it difficult to predict future earnings and incomes and thus curbs spending by firms and households, and 2) a path in which a widening of the risk premium raises interest rates and depresses consumption and investment. According to estimates, if inflation volatility increases to the level of the 1980s, annual economic growth would be pushed down by just under 0.2 percentage points worldwide and 0.3 percentage points

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in advanced economies. To sustain economic growth through price stability, it will be important to further enhance transparency in monetary policy and take steps to avoid economic fragmentation, such as establishing international coordination structures and trading rules.

● This is a English version of "物価乱高下で世界経済の停滞も—求められる経済分断の回避 と金融政策の透明性—" in JRI Research Focus (The original version is available at https://www.jri.co.jp/MediaLibrary/file/report/researchfocus/pdf/13495.pdf)

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1. High inflation is becoming prolonged worldwide

High inflation is occurring worldwide. According to the IMF, global consumer prices at the end of 2021 are 6.4% higher on average than a year earlier (Figure 1). And advanced countries, where inflation has topped 5%, are experiencing the highest inflation rates since 1990, around 30 years ago. Inflation has accelerated this year, with year-on-year consumer price rises reaching 8–9% in the U.S., U.K., and Eurozone.

Global high inflation is being driven by goods. In the U.S. and Europe, prices of non-durable goods, particularly energy and food, have climbed markedly, by over 10% year on year (YoY) (Figure 2). Durable goods prices are also rising, with the U.S. temporarily recording an increase of nearly 20%. The basic reason for the increase in goods prices is that demand shifted rapidly from services to goods during the COVID-19 pandemic, but supply has yet to catch up. Nishioka [2022] notes that a surge in U.S. demand for durable goods triggered a global increase in production, which is partly what led to supply constraints. The Purchasing Managers' Index (PMI) shows a significant increase in the number of respondents who reported delays in receiving raw materials due to the COVID pandemic, suggesting that this led to higher goods prices (Figure 3). There is no end in sight to the shortage of semiconductors, and production of automobiles, home appliances, and other products continues to be hampered. The global pressure on distribution networks is also ongoing, and marine cargo transportation has recently been disrupted once again by China's lockdowns.

Shortages in supplies of fossil fuels have also been a factor in high inflation, being translated in the form of increased resource prices. Growing concern about climate change has led to a tougher investor stance on greenhouse gas emissions, which has slowed investment in the development of oil fields.

(%) World 10 **Emerging Countries** Advanced Countries 8 6 4 2 0 1990 95 2000 05 10 15 20 (Y) Source:IMF

Figure 1. Consumer Prices (YoY)







Figure 3. U.S./Europe Suppliers' Delivery Times Index and Goods Prices



Sources: S&P Global, U.S. Department of Labor, Eurostat Note: The suppliers' delivery times index is the average for the U.S. and Europe. Goods prices are for goods other than energy and food, and are averages for the U.S. and the EU.



Furthermore, Russia's invasion of Ukraine has added to fossil fuel supply concerns. Western countries have imposed embargoes on Russian resources as a component of economic sanctions. Even the EU, which is highly dependent on Russian production, has banned the import of coal and oil from Russia, pushing up resource prices.

The supply and demand balance for food products is also tightening, and also adding to the price spike is the recent stoppage of Ukrainian wheat supplies and an increasing number of emerging economies invoking food export restrictions to secure their own supplies. In addition, price escalation is also gathering strength in

Figure 4. Consumer Prices (Services, YoY)



Sources: U.S. Department of Labor, Eurostat

the service sector. In the U.S., in particular, rents are 5% YoY, reflecting the surge in housing prices, and nonrent service prices are also rising at a faster rate than pre-COVID (Figure 4). Also In the U.S., the COVID pandemic has reduced the number of immigrants, and older workers are retiring earlier, creating a labor shortage. The resulting wage increases are pushing up service prices.

This complex interplay of multiple factors, including the COVID pandemic, decarbonization, and the Ukraine issue, is straining supply and demand in a wide range of sectors, resulting in high inflation across the globe.

2. High inflation is bringing instability

The supply-demand crunch could continue going forward. In the semiconductor sector, for example, many believe that it will take more time for the supply structure to be shored up. The supply of semiconductor manufacturing equipment, which surged in the wake of the COVID pandemic, has recently slowed, and а shortage of the semiconductors used in this equipment has been pointed out as a factor behind this (Figure 5). The semiconductor plants being built in various countries are also expected to take several years to become operational. Furthermore, establishing smooth



distribution networks is also predicted to take time. According to Clarkson Research in the U.K., new orders for container vessels in 2021 were more than four times the figure for the previous year in terms of volume, but it takes about two years from the time an order is placed to the time the vessel is actually deployed, so the shortage of ships will not be resolved until next year at the earliest. On the energy side, the trend toward decarbonization and decoupling from Russia is irreversible, and the supply-demand crunch for fossil fuels is likely to continue.

In terms of labor, it is uncertain whether the international movement of people will recover smoothly, making it difficult to foresee a solution to the labor shortage.

If supply constraints become prolonged, high inflation could become the norm. One of the characteristics of a period of high inflation is that the amplitude of fluctuations in the inflation rate increases and uncertainty rises. This is known as the "Friedman-Ball hypothesis," which many empirical studies have supported (e.g., Davis and Kanago [2000]). Looking at actual data, in the U.S., during the 1970s and 1980s, when oil shocks drove up the prices of petroleum products, the standard deviation of the inflation rate also increased as the inflation rate rose (Figure 6). The overall global inflation rate also exhibits the same trend as in the U.S. Figure 7 shows the distribution of the standard deviation of each country's inflation rate, calculated for 183 countries around the world at 10-year intervals. It can be seen that standard deviations were generally larger during the high inflationary period of the 1970s-80s than during the low inflationary period of the 2010s. Furthermore, a cross-sectional comparison of data from different countries reveals a relationship whereby countries with higher inflation rates also have larger inflation-rate standard deviations (Figure 8).

There is no clear consensus as to why the amplitude of fluctuations in the inflation rate increases during high-inflation phases. However, given the future economic climate, 1) the retreat of globalization and 2) the lack of clarity in monetary policy may increase the volatility of inflation rates.

(1) Retreat of globalization

There are two main paths along which the retreat of globalization could increase inflation volatility



Figure 6. U.S. Inflation Rate and **Standard Deviation** (%) (%) 3.5 15 Standard Deviation 3.0 12 YoY 2.5 9 2.0 6 1.5 3 1.0 0 0.5 0.0 -3 1960 70 80 90 2000 10 20 (Y/M)









Source: Prepared by JRI based on data from Penn World Table Note: Covers 183 countries, with a calculation period of 1970–2019.



(Figure 9). The first is an increase in supply-demand fluctuations. As globalization recedes and economic spheres shrink, the presence of fewer suppliers may narrow procurement options, making mismatches between supply and demand more likely to occur. As a result, supply and demand may not be in equilibrium and the supply-demand gap could widen.

The second is a change in the price-setting behavior of firms. As economic zones shrink, competition among firms stagnates and cost fluctuations are more likely to be passed on to prices. Kohlsheen and Moessner [2022] argue that the slope of the Phillips curve, which shows the sensitivity of prices to changes in supply and demand, has declined due to increased competition among firms resulting from the advance of globalization until now. They estimate that among the top 25% OECD countries in terms of the degree of globalization, the slope of the Phillips curve is a quarter of that of the bottom 25% countries. This suggests that as globalization recedes, the slope will expand and price volatility will also rise.

Currently, moves by Western countries toward decoupling from China and Russia are underway, and there is concern that globalization may be in retreat. According to world input-output tables, if procurement of all intermediate goods, including resources and parts, from China and Russia were to

Figure 9. Phillips Curve (Conceptual Diagram)



Source: Prepared by JRI

Figure 10. Production Reduction in Event of Suspension of Procurement from China and Russia



Note: Other comprises Australia, Canada, Mexico, and Turkey.

be halted, Western countries would be forced to reduce production by 251 trillion yen annually (Figure 10). Among them, Europe would shoulder just under 100 trillion yen of the drop, while Japan, South Korea, and Taiwan would together account for 70 trillion yen. These findings indicate that economic relations between Western countries and China/Russia are extremely deep, and that considerable time and cost would be required to rebuild supply chains. A rapid division between Western countries and China/Russia could significantly destabilize economies and lead to highly volatile inflation rates.

(2) Lack of clarity in monetary policy

During periods of high inflation, the monetary policy stance of the central bank is likely to be unclear, which can increase inflation-rate variability. In particular, when high inflation occurs due to supply shortages, the

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tradeoff between the economy and prices becomes greater, creating incentives for the central bank to prioritize economic stability, putting price stability on the back burner. This results in insufficient monetary tightening and greater inflation variability. This theory is articulated by Ball [1992], and empirical analysis by Conrad and Hartmann [2019] shows that the more tolerant central bank governors are of inflation during periods of high inflation, the more volatile the inflation rate tends to be.

In the U.S., the Federal Reserve Board (FRB) has recently indicated its intention to aggressively raise interest rates in an effort to quell high inflation. However, the FRB has emphasized that a recession can be avoided even with steep rate hikes, leaving room for uncertainty about its future policy stance. Regarding the outlooks of

members of the U.S. Federal Open Market Committee (FOMC), even though many expect the benchmark federal funds rate to be raised above the neutral rate, which is considered to be in the mid-2% range, the majority expect economic growth to remain at 2–3%, and no one is predicting a clear recession (Figure 11). It is unclear whether the FRB's inflation-curbing stance will waver if the economy deteriorates more than expected during the process of raising interest rates. In fact, some FRB officials have mentioned the need for a pause in interest rate hikes in the near term, suggesting a shift to a more economy-friendly policy stance.



Figure 11. Outlooks from U.S. FOMC Members

3. Price volatility is depressing economic growth rates

Greater volatility in inflation rates could reduce economic growth rates. Two possible paths to this have been highlighted: 1) a path that makes it difficult for firms and households to predict future earnings and incomes and thus motivates them to cut spending and boost savings, and 2) a path in which a widening of the risk premium raises interest rates and causes consumption and investment to fall. A number of empirical analyses have found that uncertainty over inflation reduces growth, including Grier and Perry [2000] and Grier, et al. [2004] for the U.S. economy, Apergis [2005] for OECD countries, and Baharumshah, Hamzah and Sabri [2011] for emerging economies in Asia and elsewhere.

And analyses using more recent data yield similar results to these previous studies. Estimating what sorts of factors affected the economic growth rates of 180 countries around the world over five decades from the 1970s to the 2010s, we find that the standard deviation of the inflation rate significantly depresses the economic growth rate (Figure 12). Similar results are obtained when the estimates are restricted to advanced countries (OECD countries). Since the standard deviation represents the size of the amplitude of fluctuation, the results here can be interpreted as indicative of a relationship in which the rate of economic growth decreases as the variability of the inflation rate increases. Based on these estimates, if the standard deviation of inflation in the 2020s were to rise to the level of the 1980s, the economic growth rate would be reduced by just under 0.2 percentage points



Explained variable:	World (180 countries)			OECD countries (38 countries)		
Real GDP growth rate	Estimate	Standard erro	or	Estimate	Standard erro	or
Constant term	12.771	(1.943)	***	16.775	(3.995)	***
Capital growth rate	0.127	(0.020)	***	0.207	(0.059)	***
Population growth rate	0.609	(0.115)	***	0.127	(0.299)	
Logarithm of GDP	-0.919	(0.174)	***	-1.315	(0.270)	***
Investment/GDP Ratio	2.580	(1.500)	*	11.374	(2.882)	***
Government Expenditure/GDP Ratio	-11.227	(1.553)	***	-9.041	(3.307)	***
Trade/GDP Ratio	1.227	(0.391)	***	0.975	(0.514)	*
Terms of Trade	0.082	(0.830)		0.316	(1.457)	
Standard Deviation of Inflation Rate	-0.029	(0.013)	**	-0.062	(0.033)	*
Coefficient of Determination	0.265			0.569		
Standard Error	2.794			1.205		
Sample Size	852			178		
Estimation Period	1970s-2010s (5 Decades)					
Estimation Method	Fixed Effects Model					

Figure 12: Economic Growth Rate Estimation Results

Source: Prepared by JRI based on data from Penn World Table

Note: Panel estimates with the economic growth rate as the explained variable. Shows that *, **, and *** are statistically significant at each of the 10%, 5%, and 1% levels.

per year for the world as a whole and 0.3 percentage points for advanced countries (Figure 13). Given that the pre-COVID potential growth rate of the U.S. and Europe was considered to be 1-2%, this push-down effect is significant.

Estimation Method

Given these results, in addition to calming inflation by reestablishing stable supply chains, efforts to avoid fragmentation of economic spheres and maintain a global economic system through the establishment of international coordination structures and trading rules will also be important for stabilizing prices. It will also be essential for central banks to further enhance the transparency of their policy stances toward price stability. To deliver sustainable economic growth, policymakers in each country will be required to adopt

Figure 13. Degree of Reduction in Economic Growth Rate (Annualized Rate)





Note: Degree of reduction in the real GDP growth rate in the event that the standard deviation of the inflation rate increased from the level of the 2010s to the level of the 1980s. The extent of increase in the standard deviation is the median for the entire world or the OECD.

a policy management perspective that prevents high inflation from becoming entrenched and reduces uncertainty surrounding inflation.



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