RESEARCH ARTICLE

# What makes Interest Rates volatile? Toward a Better Understanding of The Driving Forces Behind the Interest Rates Movements

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**Abstract**
Interest rates have evolved into a crucial tool for influencing economic variables since the 1960s. Their fluctuations have drawn attention since they affect individuals, businesses, and government spending decisions. Since early 2020, the Fed has resorted to decreasing U.S. interest rates to stimulate spending and investment. However, this action contributed to a significant increase in inflation, particularly in advanced economies, which threatened the efforts to recover from the pandemic. These developments prompted the Fed to increase interest rates as a means of controlling inflation and restoring economic stability. The Fed's step had been followed by other central banks, making it difficult for firms in emerging and developing economies and developing markets to obtain credit, resulting in a rise in bankruptcies and slack in economic growth. This study examines the driving forces that have been exerting an effect on the interest rates, requiring policymakers to consider them when designing and implementing their policies to achieve the targeted goals.

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## 1. Introduction

The interest rate is an essential instrument that the monetary authorities, represented by the central banks, first use to affect economic variables; by adjusting interest rates, the central banks can affect individuals and businesses' spending decisions.

With the interconnectedness of economic relations, new phenomena have arisen, urging the central banks to get involved. Inflation is considered a serious phenomenon; to combat it, central banks have been intervening by resorting to increasing interest rates to subdue prices and bring back stability to the whole economy. In addition to inflation, recession is another matter of grave concern to both the public and lawmakers. Central banks lower interest rates to make borrowing easier, which stimulates spending and investment. Therefore, adjusting interest rates becomes a common measure to achieve their goals and maintain stability.

From early 2020, the world has been overwhelmed by an unprecedented health crisis caused by the Covid-19 virus that turned into a pandemic. The pandemic drove economies into a serious recession, prompting central banks to intervene by reducing interest rates to help economic activities recover as quickly as possible. Once the economies started to recover from the fallout of the pandemic, the advanced economies, mainly the United States, began to witness a rise in prices starting in early 2022. Since maintaining stability is the primary goal of any monetary policy, central banks have actively intervened to soften inflation by increasing interest rates several times. These increases were necessary to regain control over prices and restore stability, as they generally increase the cost of borrowing, thereby reducing the demand for money and cooling down a soaring economy. However, to ensure the effectiveness of any adjustment of interest rates, central banks should consider many factors that may determine them.

This paper aims to better understand the interest rate movements by revealing the new factors that have become influential in the movements of interest rates; this can contribute to designing and implementing an efficient monetary policy and maintaining economic stability. The paper is organized as follows: In the first chapter, we shed light on the development of monetary policies in the major economies since the 1960s, focusing on changes in interest rates. Then, in the second chapter, we investigate the factors that become crucial in adjusting interest rates; these findings can help comprehend the driving forces of the interest rate movements in both the advanced economies and the emerging and developing economies (EMDEs).

## 2. Monetary policy developments

Inflation has always been regarded as the most significant concern for policymakers, making it a major macroeconomic issue because it creates uncertainty in the markets, which complicates decision-making for consumers, businesses, and the government. Therefore, price stability is of utmost importance to policymakers. However, the ability to soften inflation and bring it to desirable levels usually monitors the effectiveness of governments' policies. Therefore, governments always consider inflation when they come to implement the different policies to avoid the negative impacts of a high rate of inflation. Governments mandate their central banks to seek the roots and the impacts of inflation to better manage their policies aimed at achieving economic stability and maximizing welfare.

Inflation has been associated with the developments that have taken place in the economies. By the late 1990s, the inflation rate in industrialized countries had reached low levels. In the United States, thanks to the contractionary policy, the Fed succeeded in keeping inflation below the Taylor rate by contracting the growth rates of monetary aggregates and decreasing the U.S. interest rates to help the U.S. economy get out of the short recession. However, in 2001, the symptoms of the recovery started to arise, with the employment rate continuing to rise. Driven by growing concerns about a resurgence in the recession, the Fed kept the same pace, fixing the federal funds rate at an extremely low level. Consequently, the inflation rate was decreasing, reaching 2.8% by 2007.

Yet, the Fed was roughly blamed for evoking the global financial crisis, since it kept interest rates at a low level for a long time after the end of the recession in 2001. Meanwhile, it adopted permissive lending standards motivated by the "global savings glut," which in turn led to fueling the housing bubble.

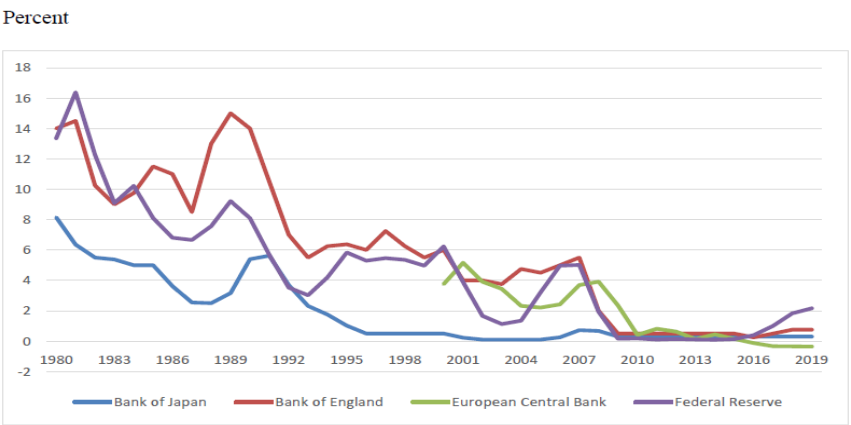
The emergence of the global financial crisis in late 2007 urged the Fed to respond rapidly by providing a liquidity facilities package to help the financial institutions to compensate for their capital losses and lost excess of liquidity through injecting a large liquidity at low interest rates, which in turn could rescue the US economy from the recession

( Lothian, 2009). The expansionary policy that the Fed adopted to confront the ubiquitous crisis accelerated the money supply. However, the crisis caused the banks to refrain from lending, fearing insolvency and bankruptcy. In addition, the economic slack and a slowdown in investment pushed the general demand to decrease. Consequently, inflation in large economies underwent a historical and unprecedented downward trend to -3% by 2009. (Robinson and El Nasser, 2013:32-34). Indeed, the easing monetary policies adopted by the advanced economies' central banks contributed to boosting the demand and, thus, rejuvenating their economies, particularly the U.S. economy, which emerged from the recession (-2.7%) in 2009 to record a growth of 2.6% in 2015. Subsequently, the inflation rate rose progressively, reaching 3.1% in 2011, and then gradually decreased to just above zero in 2015.

However, the large fluctuations in the U.S. economy during the first decade of the 21st century resulted in proliferation concerns about imminent recession, spreading uncertainty about the soundness of the U.S. economy, leading to a continued depreciation of the dollar and, hence, a deterioration of the expected return on U.S. assets. Hence, the depreciation of the dollar prompted many other countries to raise interest rates and then the costs, leading to increased inflation rates.

Once the economies began to recover from the crisis, inflation decreased gradually and then leveled up at a low level. The robust performance of the advanced economies and emerging markets backed by the Fed's quantitative easing (QE) policy that provided further liquidity to the financial institutions to persuade them to provide the economy with enough finance had a key contribution to the softening in prices (Labonte, 2017). The following figure illustrates the changes in short-term interest rates in some advanced economies over the period 2018-2024. It is clear that the central banks in advanced economies started to reduce short-term interest rates to the lowest levels after the financial crisis of 08-2009; this contributed to establishing the feeling of continuing to adopt lenient policy. This stance led to an increase in demand, which subsequently raised prices and prompted the central banks to increase interest rates.

**Figure 1:** Short-term policy rates of four advanced economies, 1980 to 2019




**Source:** ( Gamber, 2020)

Inflation continued to decrease during the Covid-19 pandemic. The measures taken to stem the spread of the pandemic had a severe adverse repercussion; most economic activities collapsed, and inflation fell amid the wide uncertainty and risks due to the effects of tight monetary policies, restrictive financial conditions, and weak global trade growth (World Bank Group, 2024). Central banks in most economies responded to confront the acute slowdown with stimulus packages. In response, the Fed intervened by injecting significant liquidity and reducing interest rates toward zero to stimulate demand and boost the U.S. economy. Those stimulus packages flooded the markets with excessive liquidity. Under the QE program, the Fed announced in 2020 that it purchased $700 billion in assets as an emergency to deal with the turmoil stimulated by the Covid-19 shutdown. Moreover, the Fed increased its holding of Treasury Bills, accounting for 56% of the Treasury issuance of securities through the first quarter of 2021.

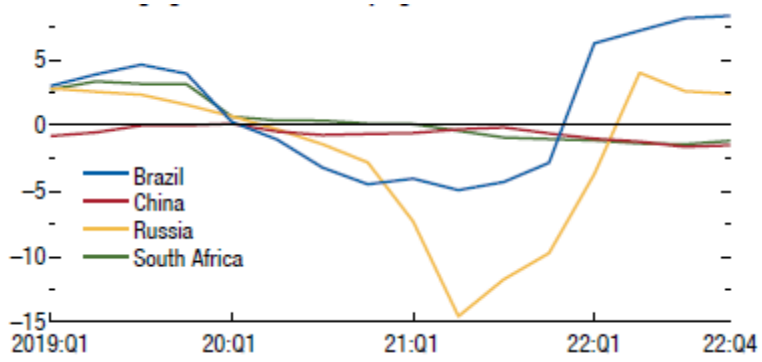
The low rate of inflation and the economic slowdown prompted the Fed to reduce interest rates near zero. These procedures resulted in the demand exceeding aggregate supply, leading to sparkling inflation (Arteta , Kamin , & Ruch, 2022).

The rise in inflation in the late 2020s caused a great deal of concern among policymakers. Indeed, several studies conducted support the Fed's step to reduce the U.S. interest rate, including Robert E. Lucas, who estimated that reducing the interest rate from 3% to zero would yield an increase of real output by approximately 0.9% that occurred through the channel of money demand (Mishkin & Serletis, 2010).

The Fed shifted toward tightening policy by increasing interest rates once the signals of the U.S. recovery began to emerge (Arteta , Kamin , & Ruch, 2022). The rise in U.S. interest rates came in response to inflation that started to skyrocket, causing the U.S. real interest rates to drop down. Raising interest rates has jeopardized other economies; according to Iacoviello & Navarro (2018), raising U.S. interest rates by 100 basis points reduced GDP in advanced economies and emerging economies by 0.5 and 0.8%, respectively, through exchange and trade channels. This shock also reduced U.S. GDP by about 0.7% after two years. The decrease reflected the vulnerability of economies to the U.S. monetary stance, although the index showed that emerging economies are more fragile due to the commercial and financial ties with the U.S. economy (Matteo & Navarro, 2018).

Many other central banks followed the Fed in raising interest rates, including the central banks of Brazil, Chile, and several other EMDEs (IMF, 2024). The following figure shows the changes in real short-term interest rates in some emerging markets from early 2019 to late 2022. During that period, interest rates recorded sharp fluctuations, reflecting the vulnerability of those markets to events that take place in the advanced economies.

**Figure 2:** Real short-term rates in some emerging markets




**Source:** (IMF, 2022)

It is worth mentioning that the Fed has defined a longer-run goal of 2% inflation as a target to achieve its responsibility for price stability (Labonte, 2017). Subsequently, the rise in U.S. interest rates forced many firms into severe financial difficulties, hardened expanding their activities and overcoming the fallouts from the pandemic, and refinancing their debt. As a result, company bankruptcies rose, borrowing costs skyrocketed, and thus investments shrank in several economies.

Besides, increasing interest rates subdued government bond prices and a large sell-off, making it difficult for several governments to get adequate funding for the stimulus packages they have adopted to confront the pandemic.

This event is largely known as "taper tantrum," which causes the financial markets to become more volatile, especially those in developing economies, as their currencies become less attractive and then depreciate. Furthermore, "taper tantrum" usually reflects in the spread of risk aversion among investors, which results in a breakdown of confidence in financial markets in developing economies, prompting the funds to outflow and anticipation of upward foreign debt (Arteta , Kamin , & Ruch, 2022). In this respect, the IMF recommends countries reduce deficits to tackle inflation and address debt vulnerability. The IMF urged countries to avoid excessive tax cuts that may worsen the cost of living and negatively impact vulnerable groups, who typically cannot adjust their consumption to reduce spending on increasingly expensive products. In addition, the IMF praised fiscal consolidation as it contributes to sending a powerful signal (IMF, 2022). Indeed, the weaknesses and sometimes the lack of financial markets in many developing economies made the repercussion of public debt worse for banks that encountered a drop in liquidity resulting from the difficulties in selling government bonds, in which their prices fell, exposing the banks to large capital losses (Alter et al, 2024).

While the advanced economies were struggling to soften inflation and recover, the Russian invasion of Ukraine in February 2022 fueled more pressures on food and energy prices that soared in tandem; this co-movement added further inflationary pressures, complicating the efforts to stimulate the economies. Subsequently, the expectation was triggered of a further rise in inflation (Arteta , Kamin , & Ruch, 2022).

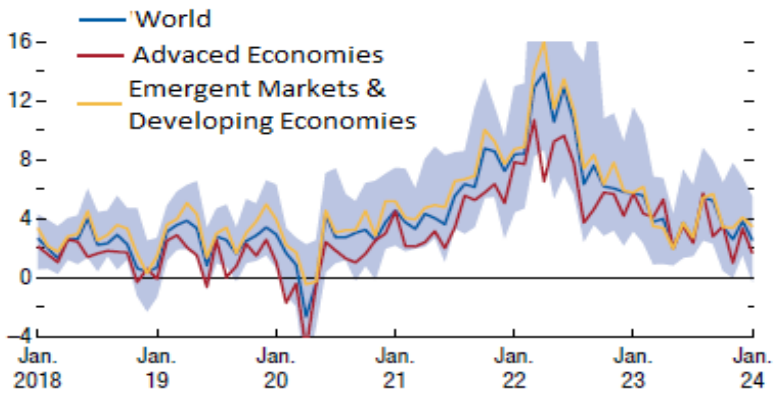
The rise in food and energy prices added another challenge to the imported economies, as they affect almost all sectors. According to the IMF's econometric study, a 10% rise in oil prices contributes to a 2% rise in cereal prices after three to four quarters. In contrast, a rise of 10% in prices of fertilizers, due to a natural gas supply shock, has a delayed effect of a 7% rise in cereal prices after one quarter. The evidence clearly shows that economies with greater trade openness are more likely to be exposed to global food price

shocks, which may force the importing economies to borrow to meet their food imports, thus increasing external debt and weighing the burden on the public budget.

In 2022, inflation in advanced economies peaked at its highest rate since 1982. U.S. inflation hit a peak in about 40 years, with prices in August 2022 at 8.3%. In September 2022, inflation in the eurozone reached 10%, while inflation in the UK reached 9.9%, while inflation in EMDEs was at a higher rate, reflecting the vulnerability of those economies (IMF, 2022). However, the tightening of monetary policies in advanced economies and the raising of interest rates, along with the fading of relative price shocks—primarily related to energy prices—contributed to a restriction in energy demand in 2023, which helped bring down inflation (IMF, 2024). The IMF staff estimated that inflation pressures would continue to decline, with advanced economies experiencing a faster cooling than EMDEs (IMF, 2023).

Several risks, such as the ongoing war in Ukraine and the ongoing attacks in the Red Sea, pose a significant threat to inflation. In this regard, Red Sea tensions have led to a 50% rise in global freight rates of oil product tankers. These events may undermine business and consumer sentiment, particularly if food and energy constitute a large share of household expenditure. Hence, interest rates would be likely to increase (IMF, 2024). The following figure illustrates the evolution of global inflation. Inflation in all regions hit a peak in early 2022; this historic level was followed by a sharp decrease starting from the second half of 2022. It is clear that global inflation has been affected by the events and the policies adopted in advanced economies, particularly the United States, which has tied other economies with its markets through the financial and trade channels, making them more vulnerable to the U.S. shocks.

**Figure 4:** Global Inflation (percent)




**Source:** (IMF, 2024)

It is worth mentioning that the production of energy and food commodities is characterized by high geographic concentration and weak elasticity of demand, enabling the events in producing economies to have substantial impacts on the prices. Russia is responsible for about 65% of the world's agricultural output, 50% of its energy output, and 70% of its mineral commodities. Therefore, prices of energy and food skyrocketed just after the Russian invasion of Ukraine, causing the disruption of the supply chains of many other products. According to the World Bank, this disorder in 2022 deepened the food insecurity dilemma in low-income economies that depend on more than 80% of their needs for wheat on imports, in which 75 million to 95 million people were living in extreme poverty in 2022 compared with prepandemic times

(IMF, 2023). Thus, about 30% of the global population faced moderate or severe food insecurity in 2022 (World Bank Group, 2024).

This surge in inflation in early 2022 was a turning point for the Fed. the Fed and several central banks became hawkish; they increased interest rates faster than expected (Brandao-Marques, Meeks, & Nguyen, 2024). In light of the slowdown of the economies in 2022, raising interest rates was a sacrifice of growth for abating inflation. The Fed's federal funds rate increased from 0.08% to 3.08% in October 2022 (IMF, 2022). In its latest interest rate decision in November 2022, the federal funds rate increased further to a target range of 3.75-4% (Moschella & Polyak , 2022). That increase in U.S. real rates in 2022 was the largest and fastest since the early 1980s (World Bank Group, 2024).

Several central banks have taken measures to curb inflation and maintain the value of their currencies against the U.S. dollar. For example, the Bank of England has raised its policy rate by 2% since the early 2020s despite projecting weak growth. The European Central Bank has also raised its policy rate by 1.25% in 2022 (IMF, 2022). That sharp increase in interest rates widespread the uncertainty about the long-term yields on advanced-economy government bonds, which became volatile in 2023, and thus shifted expectations about the path of future interest rates and sizable movements in term premia (World Bank Group, 2024). The resort to increasing interest rates to confront inflation reflects the vulnerability of the advanced economies to the external events, including the Russia-Ukraine conflict, which had already increased the costs of production in the region through the energy and food channel (IMF, 2022).

The rapid increase in interest rates by other major central banks has resulted in a credit crunch. According to surveys in the United States and Europe, banks restricted access to credit notably over 2022 and were expected to remain so in coming months. Higher interest rates put increasing pressures on banks in major economies. Hence, demand for credit and investment in advanced economies declined, and uncertainty spread among investors, making the issuance of new bonds difficult, this made the short-term recovery hard to achieve. In this context, developing economies had been seriously affected by the increase in U.S. interest rates and appreciation of the U.S. dollar, making borrowing from the largest financial markets extremely costly, putting a heavy burden on their budgets that had been suffering from the decline in taxes and increase in expenditures during the pandemic. Alter & Others' (2024) study suggested that the high reliance of banks in some MENA economies on external funding at variable interest rates and in U.S. dollars exacerbated the banking sector's vulnerability to the risk of sudden deposit withdrawals. Therefore, many developing economies competed to raise interest rates rapidly at the beginning of 2022, exposing banks to capital losses (Alter et al, 2024), and therefore impairing their abilities to back businesses and growth prospects.

In the end, the rise in interest rates in major economies could provoke crises in EMDEs. Kose et al. (2020) state that a 2-percentage-point increase in the U.S. real interest rate, which is about half the cumulative increase in a typical hiking cycle, increased the probability of a currency crisis by half: from 4.1 to 6%. At times growth slacks; raising interest rates to curb inflation will likely aggravate default risk to business, leading the banks to further decrease their lending. Arteta, Kamin, and Runch (2022) estimated that shocks to U.S. interest rates increased the probability of a financial crisis in developing economies by 36 to almost 40%. Thus, it is likely that a 25 basis-point increase in U.S. 2-year yields would boost the likelihood of a crisis by only 3 percentage points. So, a doubling of the interest rate shock leads to a more-than-doubling of the rise in the probability of a crisis.

## 3. Major determinants of interest rates

At the beginning of 2022, a wave of soaring prices invaded major economies, propelling the authorities within to increase interest rates. To determine the required rate, monetary authorities consider many factors. Literature provides several factors that propel the monetary authority to adjust the interest rate. Interest rates have been a core area of studies that have sought to reveal the factors responsible for their movements, including:

### 3.1. Economic performance

The Keynesian theory called for policies that keep interest rates constant at the lowest possible level to facilitate investment by expanding the money supply and stimulating demand (Patterson & Lygnerud, 1999). Over the past four decades, the Fed has tended to decline the real interest rates in response to the fall in inflation rate, so real risk-free interest rates in the United States and globally have declined ( Gamber, 2020). The most recent stance was during the financial crisis of 2008, when the Fed ran an expansionary monetary policy that reduced interest rates to what is referred to as the zero lower bound, from 5.25% in September 2007 to a range of 0% to 0.25% in December 2008, to stimulate the economy through encouraging investment and consumer-durable spending.

The synchronization of reduction in inflation and interest rates usually contributes to depreciating exchange rates, causing exports to rise and imports to fall, all else equal. Once the crisis began to dissipate, the Fed shifted its policy toward a tightening policy characterized by raising interest rates (Labonte, 2017). Indeed, the interest rate rising involves risk; if the Fed raises rates too slowly, the economy could overheat, causing inflation to heighten and then posing a risk to financial instability. On the contrary, if the Fed raises rates too quickly, it could prematurely choke off the economic recovery and then lead to deflation.

During the first stage of the pandemic, the global economy shrank dramatically, so the central banks in advanced economies responded in early 2020 by declining, leading to a shift in the investors' portfolio preferences toward the safe assets, particularly treasury bills. However, the shift in preferences compelled businesses to pay a premium for the bonds they issued, driving the borrowing costs to increase and then making investments less lucrative. Therefore, businesses were compelled to increase the prices, fueling the expectation of an inflation increase. In this atmosphere, central banks are urged to interfere to subsume inflation by increasing interest rates despite the fallout from this step on growth. Yet, the drop in interest rates that approached zero percent triggered expectations of a future increase whenever any economic recovery was recorded ( Gamber, 2020). The recovery, however, may drive savings to rise, thereby reducing the need for an adjustment in real interest rates and thereby reducing the need to adjust interest rates (Tease , et al., 1991). In the atmosphere of the economic recovery, the capital share of income rises, driving interest rates to a further increase( Gamber, 2020).

### 3.2. Government deficit

Excessive government spending may reduce global savings and then fall into a deficit, which may force the government to increase income taxes. The latter is likely to shrink the money left for saving and then adjust the interest rate (Tease , et al., 1991).

The significant financial packages that EMDEs intervened to stimulate the slacking economies widened fiscal deficits in 2023, leading to mounting public debt and then increasing interest rates (World Bank Group, 2024).

Higher public debt spills over to the banks that hold government bonds. The decline in sovereign credit ratings makes selling these bonds for banks difficult, exposing banks to large capital losses.

A government deficit usually leads to the crowding out of private investment due to limited available lendable funds, which in turn necessitates an increase in real interest rates to maintain equilibrium between saving and investment. Though, according to "Ricardian Equivalence," the government deficit would drive taxpayers to raise their anticipation of higher taxes in the future, dropping the aggregate demand, and then decrease the interest rates (Tease , et al., 1991).

The sustained fiscal deficits may heighten the risk of rapid capital outflows and raise the probability of a new wave of costly sovereign debt defaults. High debt levels weaken fiscal sustainability, deter investors from investing, and increase financing costs; therefore, they reduce the effectiveness and the feasibility of fiscal stimulus measures. The synchronization of weak growth, high government debt, and elevated interest rates that fell out from the pandemic has contributed to a sharp increase in net interest payments as a share of government revenues in EMDEs (World Bank Group, 2024).

In this respect, the IMF recommends countries reduce deficits to help address debt vulnerabilities and tackle inflation. The IMF urged countries to avoid surging tax cuts that may exacerbate the cost of living. In addition, the IMF praised fiscal consolidation since it contributes to sending a powerful signal (IMF, 2022).

### 3.3. Productivity

The pandemic exposed the vulnerability of most EMDEs' economies, which had experienced a historic contraction and declines in industrial productivity. The tightening policy has further weakened the industrial sector, particularly in the United States, where the Fed has raised interest rates and increased the dollar's value, leading to a decline in the competitiveness of developing economies. This vulnerability manifests in the decline in investments. The recent increase in oil and food prices following the Russia-Ukraine war confirmed the vulnerability of open economies to global food price shocks, which are likely to induce food exporters to impose restrictions on food and energy exports; this may cause a further increase in global prices (IMF, 2022).

Productivity can influence interest rates. Productivity is instrumental in decreasing prices as it contributes to providing products at the lowest cost, reducing the need for increasing interest rates. Having improved productivity, the competitiveness of local products improves, motivating local authorities to reduce interest rates to sustain competitiveness.

### 3.4. Decline in investment

Given the strong correlation between investment and output, increases in investment generally induce the output, which will lessen the need for an adjustment in real interest rates (Tease , et al., 1991). Many studies pointed out that the global downward trend of investment drove the global interest rates to decline through the channel of the demand for loanable funds that shrank ( Gamber, 2020). When the economy is humming, after the expansion of the business cycle, the expectation of investment opportunities to be profitable rises, thereby firms become more willing to borrow to expand their investments, increasing the quantity of bonds supplied at any given bond price and interest rate as well. While the demand for loanable funds increases, interest rates rise (Mishkin, 2004).

Having raised the U.S. interest rates, the difference in interest rates between countries pushed up further the exchange rate value of the dollar, thereby leading to making the U.S. economy more attractive to investment at the expense of other economies (Labonte, 2017). The devaluation of other currencies against the U.S. dollar is likely to raise prices in the U.S. economy's partners, including the developing markets that have pegged their currencies explicitly or implicitly to the U.S. dollar, causing a large shrinkage of their economies (Crowley, 2010), given that the U.S. dollar contributes to about 60% of the world's foreign reserves, making the fluctuations in the U.S. dollar's value have a significant influence on global economic activity.

The openness adopted by many Emerging Markets and Developing Economies (EMDEs) to attract foreign investment has made them vulnerable to external shocks. Studies indicated that, due to higher openness, the intense competition faced by firms in importing economies may reduce their willingness to adjust prices (Obstfeld, 2020). Therefore, monetary policy discipline is needed to limit inflation volatility due to its costs reflected in threatening to undermine the competitiveness of local producers as well as exacerbate the uncertainty of returns (Bowdler & Malik, 2005). Furthermore, adopting open policies has made EMDEs at higher exposure to the effects of the advanced economies' measures, most recently the austere policies that the Fed and several other central banks resorted to address inflation, which resulted in increasing the borrowing costs for EMDEs (IMF, 2022). Because most EMDEs have weaker fundamentals, the appetite for investing in these economies sharply decreased during the pandemic, which forced them to reduce interest rates in order to attract more investment and revive their economies while mitigating the savings gap.

However, as soon as the economies had started to recover from the pandemic, the Russia-Ukraine war burst, causing inflation waves to spread, compelling the authorities to elevate interest rates. Amid fears of the war's expansion, uncertainty in markets spread, causing investments and productivity growth to decelerate, especially in EDMEs after increasing interest rates. According to the World Bank estimation, the growth of investment in EMDEs in 2023-24 is expected to average 4.1% per year, which represents just over half the average pace over 2000-19 (World Bank Group, 2024). Higher interest rates increased pressures on banks in major economies, leading to a decrease in credit and investment demand during the first half of 2022; this situation will likely contribute to a reduction in interest rates.

### 3.5. Demographic forces

In light of the decline in population growth, the labor force growth may slow; this morph will be likely to change the saving behavior. For decades, the population in developing economies has changed as the aging rate rose, causing a decrease in consumption, an increase in savings, and a decrease in the interest rates. This transformation makes these economies an important world supplier of savings. In the coming decades, the increase in aging is expected to put pressures on pension funds, thus forcing the governments to raise spending on health care and support pension funds. These changes are likely to increase interest rates, especially if investment and productivity do not respond (Tease , et al., 1991).

Indeed, individuals' saving behavior fluctuates throughout their lifetime. After retirement, individuals' savings tend to contract, causing the fund available for investment to shorten. The act of dissaving suggests that the aging population will continue to exert downward pressure on interest rates for several years to come. Moreover, aging influences interest rates by affecting labor force participation. The slow growth in the labor force may increase the amount of capital per worker in the long term, thereby reducing the return on capital and, in turn, the return on government bonds and other investments. This results in pressure on the real interest rate due to the increasing ratio of capital to labor, which subsequently lowers the marginal

product of capital. Several studies estimate that those factors account for roughly 100 to 200 basis points of the decline in global real interest rates since the early 1980s ( Gamber, 2020).

Life expectancy is another factor that may affect interest rates; increased life expectancy will be likely to lead to a decline in the rate of time preference and thus to a decline in the equilibrium real interest rate.

### 3.6. Global saving glut

The global saving glut was one of the main factors that caused low mortgage rates that contributed to fueling the housing bubble over a decade before the onset of the 2008 global financial crisis, impairing the Fed's ability to control and thwart any turmoil. Subsequently, the Fed was compelled to tighten its policy (Labonte, 2017). The glut began to arise in the early 2000s; its genesis can be attributed to (1) the rising prices of oil and other commodities in the early 2000s, leading to increased saving of exporting countries, and (2) faster growth of high-saving emerging markets, particularly China. The global saving glut put downward pressure on global interest rates. The expansion of emerging markets is expected to contribute to dropping interest rates in advanced economies, particularly the USA, as the emerging markets are considered the main rivals for advanced economies in attracting foreign investments.

The saving glut helped the economies with saving deficiency to finance the investments. However, the lack of attaining the funds for autarky through funding investments with foreigners's excess of savings leads to exacerbating their current account deficit. The shift of the residents' demand toward foreign assets may be a source of disturbances due to its monetary policy implications. According to Gourinchas and Rey (2016), global savings are likely to depress real interest rates by −0.2 to 0% until 2021, which they described in 2016 as an extended period of time ( Gamber, 2020).

Nevertheless, the pandemic caused the global savings to shrink, especially in the advanced economies, first and foremost the USA. The pandemic caused a sharp decline in global revenues and a loss of jobs, creating a historic fall in personal savings and in business 'savings due to low demand (IMF, 2023). Households in major advanced economies have drawn down savings accumulated during the pandemic to limit the impact of rising borrowing costs on their spending (IMF, 2024). The decline in saving prompted banks to restrict credits (IMF, 2023), raising interest rates (IMF, 2023).

### 3.7. Money supply

Money growth is considered a predominant determinant of inflation due to its effects on demand; it affects inflation through many channels, including real interest rates (Crowley, 2010). Liquidity preference analysis suggests that expanding the money supply would lower interest rates (Mishkin & Serletis, 2010), leading the inflation rate to soar, which in turn discourages demand and investment. The liquidity effect has been generally well received by monetarists, who consider inflation a monetary phenomenon (Thomas, 2012). Research demonstrates that economies with the highest inflation rates also have the highest money growth rates, and vice versa.

Yet, as the money growth rate continues hiking, the long-term interest rate rises (Mishkin, 2004). The money supply's effect becomes more acute with floating exchange rate regimes. Loungani & Swagel (2001) pointed out that money supply was the predominant factor in economies with a floating exchange rate regime; this means that inflation is the most impacted by money growth (Loungani & Swagel, 2001).

Nevertheless, monetarists argued that money supply movements are merely an influencer on inflation; the price level is induced by an increase in the money supply, raising interest rates.

The continuing increase in government expenditure usually can lead to flooding the market with excess liquidity, shifting the demand to a higher level, which in turn crowds out the private sector over the funding available, and then surging interest rates (Mishkin & Serletis, 2010). The expansion of government spending is likely to result in increasing deficits, which may force the government to borrow by issuing bonds, raise taxes, or, in the worst case, print money, ultimately leading to an increase in interest rates (Mishkin, 2004). Some economists do not agree with the belief that budget deficits affect the monetary base and then interest rates; their analysis is based on the assumption that the issuance of bonds will cause the public to believe it will be subject to higher taxes in the future to pay off these bonds. The anticipation of higher future taxes will increase public demand for bonds to match the increased supply, leaving the bond price and interest rate unchanged. Hence, there is no need for the central banks to purchase bonds to prevent interest rates from rising (Mishkin & Serletis, 2010).

### 3.8. Shortage of safe assets

The recent pandemic has pushed both investors to adjust their portfolios by shifting their preferences toward safe and default-risk assets, particularly the government bonds. Thus, the frenetic demand for these safe bonds put further downward pressure on interest rates by more than the return on risky assets. The sharp increase in demand for safe assets, most notably U.S. Treasury bills, has prompted the U.S. government to supply more securities to leverage the increase in interest rates on their assets, calm the markets, handle the bubbles, and prevent the speculation that can lead to raising the expectations of an imminent drop in interest rates. However, the preference for safe assets forces companies to increase the interest rate on their bonds to attract investors, increasing the burden of borrowing costs for them and then exacerbating the financial situations ( Gamber, 2020).

### 3.9. Secular stagnation

Secular stagnation is a condition in which the economy operates persistently below its potential level of output because of low demand or when desired saving exceeds desired investment. This condition puts downward pressure on the real interest rate, which can go below zero. At the onset of the pandemic, economic activities collapsed, and demand shrank, driving the inflation to fall down amid a wide uncertainty (World Bank Group, 2024). Thus, the Fed shifted to easing policies by setting the federal funds rate back to zero (Arteta , Kamin , & Ruch, 2022). Similarly, several countries followed the Fed's measures, which helped lift the demand (Cochrane, 2024). In this regard, several studies conducted in the USA on the welfare of low interest rates, including one by Robert E. Lucas, estimated that reducing the interest rate from 3% to zero would yield an increase of real output by approximately 0.9% through the channel of money demand (Mishkin & Serletis, 2010). In addition, the Fed implemented the QE program; it announced in 2020 its plan to purchase $700 billion in assets. Moreover, under the program, the Fed increased its holding of Treasury Bills, accounting for 56% of the Treasury issuance of securities through the first quarter of 2021 (Arteta , Kamin , & Ruch, 2022). However, the increase in demand abetted inflation to spike late in that period and became a blowout, inducing considerable concern for policymakers.

### 3.10. Expected inflation

The volatility of inflation or expected inflation may affect interest rates; this volatility forces the bond issuers to provide investors with a premium to offset the risk of holding assets ( Gamber, 2020). The expectation of an increase in inflation is likely to put upward pressures on interest rates (Howe & Pigott, 1991-92). Since firms are only concerned with the real costs of borrowing, for a given interest rate, as long as the expected inflation increases, the real cost of borrowing falls, prompting firms to increase the quantity of bonds supplied at any given bond price, hence raising the interest rate. Therefore, according to the Fisher effect, when expected inflation rises, interest rates will rise, urging the reduction of inflation to keep the inflation rate low, and vice versa (Mishkin, 2004).

In addition, studies added further factors that can affect interest rates and then the equilibrium of long-term interest rates. These factors include (1) the rate of physical capital's return, which represents the rate at which current savings are transformed into future output via the channel of investment. (2) bond's risk, which compels it to pay a risk premium to compensate for the uncertainty about the future value of the asset held. (3) Deregulation and other extensive changes in financial structure; these changes were responsible for the rapid growth of private sector debt during the 1980s (Howe & Pigott, 1991-92). It should be noted that most monetary authorities take these factors into consideration in their interest rate projections.

The outbreak of the pandemic forced governments to take measures to stop its spread, which led their economies to fall into a serious recession. Thus, short interest rates dropped further close to zero, backed by the intervention of central banks by significant packages to stimulate the slowing economies. Reducing interest rates was an important element in stimulus packages; for example, the Fed reduced the federal funds rate from 1.6% to near zero over a span of two weeks in early to mid-March 2020. As a result, long-term interest rates decreased following the Fed's intervention, which included direct purchases of long-term securities and the launch of several lending programs designed to inject sufficient liquidity into the financial markets.

Moreover, the large-scale purchase of assets initiated by central banks in response to the pandemic and the shift in the perceived riskiness of the economy following those events contributed to drastically decreasing the interest rates. During the first stage of the pandemic, the markets experienced an unexpected shift in the demand toward risk-free, highly liquid assets ( Gamber, 2020). Subsequently, interest rates fell further down, backed by the fall in investment as firms postponed or cancelled many projects. In turn, governments took part; the U.S. fiscal policymakers approved in mid-April 2020 adding$1.7 trillion to the projected debt over the coming decade. The increase in federal debt relative to GDP will put upward pressure on interest rates.

As it had been expected, the recovery from the economic fallout from the pandemic persuaded the Fed to elevate interest rates, leading the national debt to further rise.

However, the first signs of a global rebound from the economic fallout, although slow and vulnerable, arose in 2021 (5.6%) (World Bank Group, 2021), and governments and central banks were supposed to begin to reduce their facilities and end some programs; this would shift investors back toward more risky assets. Those events would potentially put additional upward pressure on interest rates on government securities (risk-free securities). The Fed responded to the signals of recovery by shifting its monetary policy from easing to tightening, which involved tapering government bond purchases and subsequently raising interest rates in an effort to combat inflation that had reached concerning levels (Arteta , Kamin , & Ruch, 2022). The Fed's move to raise the nominal interest rates came after inflation expectations had started to rise, causing lower real rates that initially supported economic activity.

Other central banks, including those in other advanced economies, have followed the Fed's lead (IMF, 2024). The unexpected rapid rise in interest rates by the Fed put a severe strain on advanced economies, particularly those struggling to break out of the recession, since obtaining credit for firms became difficult as a result of tight lending by banks, making the recovery and the refinancing of debt difficult. As a result, corporate bankruptcies rose, borrowing costs were getting higher, and thus investments were undermined in several economies. Increasing interest rates subdued government bond prices, which experienced an unexpected sharp downward as a result of a sharp sell-off. This event is largely known as the taper tantrum, which scourges the financial markets of developing economies as their currencies become less attractive and then depreciate.

The Russian invasion of Ukraine in February 2022 put further pressure on food and energy, so their prices soared in tandem; this co-movement triggered the expectation of a further increase in inflation. The expectations are tense in economies that adopt a fixed exchange rate regime. According to Loungani & Swagel (2001), the economies with fixed exchange rate regimes have been the most affected by oil and commodities price increases, so inflation mounted (Loungani & Swagel, 2001). n response, the Fed and other central banks further increased interest rates, and accordingly, financial conditions have been tightened, making it harder for firms to borrow. In its 2023 economic forecast, the IMF indicated that the Federal Reserve's key interest rate is expected to peak at its current level of around 5.4%, while the Bank of England's interest rate will peak at around 6%, and the European Central Bank (ECB) will raise interest rates to a peak of 3.9%, all of which will then decline in 2024 (IMF, 2023).

The rise in U.S. interest rates led to the appreciation of the U.S. dollar against the euro, putting more recessionary pressures on Eurozone economies; a strong dollar is likely to dampen U.S. domestic demand and weaken competitiveness, and therefore amplify the impact of the ECB monetary tightening on euro area economic activity. In response to the persistence of inflation in addition to the effect of the Fed's aggressive hike in interest rates, the ECB was prompted to raise interest rates, so the Fed-ECB interest rate differential shrank from 0.125 in 2021 to 1.875 percentage points in September 2022 (Moschella & Polyak , 2022). Given that the U.S. and Eurozone markets are the primary sources of loans for most EMDEs, the increase in interest rates in these markets has negatively impacted EMDEs, which have been struggling to recover from the pandemic during which their indebtedness rose to historic levels.

Therefore, adjusting interest rates has consistently been the primary tool that policymakers use to address any threats to economic stability.

## 4. Conclusion

Events revealed that the interest rate is the most used instrument by central banks to address phenomena. Since the 1960s, central banks have turned to adjusting interest rates to affect economic variables and then maintain economic stability. This is clearly noticed when advanced economies have been exposed to the pressures of inflation and recession. At the beginning of the current decade, economies experienced a sharp recession due to the Covid-19 pandemic, which forced the governments to restrict economic activity and close borders, resulting in a shrink in growth, especially in the EMDEs, which overly rely on foreign trade. This situation led the governments to reduce interest rates to stimulate spending and investment. Once the economies began to recover from the repercussions of the pandemic, inflationary pressures began to rise to dangerous levels, prompting central banks to intervene, particularly the Fed, by resorting to increasing inflation rates to curb inflation and preserve purchasing power and lessen the uncertainty that propagated the markets, despite the adverse impact of increasing interest rates on investment. Therefore, interest rates have become an essential tool in implementing monetary policy. Nevertheless, targeting interest rates

becomes harder due to the complexity of economic life and the entanglement of economic relations within the economies and between them; this has enabled new factors to have a major impact on interest rates. Therefore, monetary policymakers are required to consider the factors when designing and implementing policies to ensure the achievement of the targeted goals.

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