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Liquidity Trap: What Is to Be Done?

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Important note: Some passages in this paper are adapted from two earlier publications by one of the coauthors: (1) Akram, T. 2016a. “Japan’s Liquidity Trap.” Levy Institute Working Paper No. 862. Annandale-on-Hudson, NY: Levy Economics Institute of Bard College. <http://www.levyinstitute.org/pubs/wp862.pdf> and (2) Akram, T. 2016b. “Japan’s Liquidity Trap.” Real-World Economics Review 76: 16–42. <http://www.paecon.net/PAERReview/issue76/Akram76.pdf>

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ABSTRACT

Major advanced capitalist economies—including Japan since the mid-1990s, and the United States, the euro area, the United Kingdom, and Canada after the 2008 global financial crisis—have experienced prolonged liquidity traps characterized by low growth, low inflation or deflation, and persistently low long-term interest rates. Paul Krugman and Ben Bernanke have argued that, by lowering real interest rates and reviving inflation expectations, a central bank's credible commitment to sustained monetary easing is sufficient to escape such traps. Drawing on John Maynard Keynes's theory of liquidity preference, this paper contends that monetary easing, while possibly necessary, is not sufficient for recovering from a liquidity trap. As interest rates fall, the duration and convexity of long-term bonds rise, heightening investors' fear of capital losses and reinforcing the preference for cash. A liquidity trap reflects a breakdown between investment expectations and effective demand under fundamental uncertainty. It is argued here that overcoming a liquidity trap requires a three-pronged strategy that includes: (1) yield curve stabilization to reduce interest rate volatility, (2) expansionary fiscal policy to directly support effective demand and employment, as well as revive animal spirits, and (3) Schumpeterian structural reforms to foster creative destruction, new industries, new products and services, and productivity growth. The paper concludes that a coordinated monetary-fiscal-structural strategy, rather than merely accommodative monetary policy, is necessary to durably escape a liquidity trap.

JEL CLASSIFICATIONS: E40; E43; E50; E52; E58; E60

KEYWORDS: Liquidity Trap; Monetary Policy; Interest Rates; John Maynard Keynes; Paul Krugman; Ben Bernanke

SECTION I. INTRODUCTION

The experience of advanced capitalist economies in the past two decades reveals that they can experience a liquidity trap, which is a condition characterized by low economic growth and low inflation or deflation amid low interest rates. Japan experienced one from the mid-1990s until 2020, while other major economies—including the United States, the euro area, the United Kingdom, and Canada—fell into liquidity traps after the global financial crisis in 2008, experiencing several years of slow growth, high unemployment, and inflation below their central bank’s target, even though long-term interest rates were low. A liquidity trap reflects a failure between investment expectations and effective demand amid heightened uncertainty about the economic outlook, where investors are unable to assign a mathematical probability to the expected state of the world, making monetary policy alone an ineffective tool for addressing the problem (though accommodative monetary policy may also be necessary as part of a broader set of policies).

Paul Krugman (1998a, 1998b) and Ben Bernanke (2000, 2002) argued that a credible commitment by the central bank to sustain monetary easing, resulting in low nominal and real interest rates, can reignite inflation and end such liquidity traps. However, for John Maynard Keynes ([1936] 2007), the possibility of a liquidity trap arises from investors’ liquidity preference and the fear of capital losses due to uncertainty about the direction of interest rates and the state of effective demand.

This paper argues that addressing a liquidity trap requires a three-pronged approach consisting of: (1) yield curve stabilization at low rates and reduced interest rate volatility, (2) fiscal measures to stabilize economic activity, promote investment, and increase employment, and (3) structural reforms to create demand for new goods and services, give rise to new industries, and foster “creative destruction,” as articulated by Joseph Schumpeter ([1943] 1976). Section 2 undertakes a brief review of the literature, while section 3 examines some stylized facts about interest rate dynamics in key advanced economies, including in the years each of these economies was burdened by a liquidity trap. Section 4 discusses and critically assesses Krugman’s (1998a, 1998b) and Bernanke’s (2000, 2002) arguments and policy

recommendations, while section 5 considers Keynes's ([1936] 2007) analysis of a liquidity trap and explicates his and various post-Keynesian policy recommendations. Section 6 draws on Schumpeter's ([1943] 1976) observations about capitalism to support the argument that structural reforms are also necessary for overcoming a liquidity trap. Section 7 concludes with a summary and some open questions for further research.

SECTION II. A BRIEF REVIEW OF THE LITERATURE

The theoretical debate over a liquidity trap traces back to Keynes ([1936] 2007), who first identified the possibility that monetary policy could be powerless when investors' liquidity preferences become effectively infinite at low interest rates (Keynes 1930, 1932, [1936] 2007). However, this idea lay dormant for decades until Japan's prolonged stagnation revived interest in the phenomenon.

Krugman (1998a, 1998b) reintroduced the liquidity trap concept, arguing that a central bank could escape one only by credibly committing to future inflation, thereby lowering real interest rates even when nominal rates were at the zero lower bound. Examining Japan's dismal growth record in the 1990s, Krugman (1998a, 1998b) opined that the Bank of Japan's (BOJ) monetary policy was ineffective. Since the nominal interest rate was low while the economy was in deflation, the real interest rate was high. He held this responsible for the country's dismal performance, asserting that investors and the public expect future deflation since the nominal interest rate was already low and could not be reduced further.¹

Bernanke (2002) approached the problem from a policymaker's vantage point, contending that Japan's inability to escape deflation reflected political constraints rather than any technical limit on monetary policy. In his view, a sufficiently determined central bank could always generate inflation through balance-sheet expansion and exchange rate depreciation. This monetarist strand

¹ Krugman (1998a, 1998b) did not conceive of the possibility of negative interest rates in 1998. Hence, for him, zero or near-zero interest rate policy constituted the effective lower bound. Keynes ([1936] 2007, 168), too, did not envision this possibility. He confidently asserted: "the rate of interest is never negative." To quote Winston Churchill (1941): "This is one of those cases in which the imagination is baffled by the facts."

of the literature, building on the quantity theory of money, has been challenged on several fronts. Joan Robinson (1937) offered an early critique of the quantity equation, warning that treating money as directly causing price changes obscures the more-complex channels through which demand and supply interact, a critique that remains salient given the post-2008 breakdown in the empirical relationship between central bank balance sheets and monetary aggregates.

A distinct post-Keynesian literature has emphasized liquidity preference and endogenous money as the more relevant lens through which to view a liquidity trap. Jan Kregel (1998, 2000, 2011, 2014) has argued across several papers that Krugman's inflation-targeting solution underestimates the extent to which duration risk deters bondholders from reentering markets as interest rates fall, and that this risk becomes a self-reinforcing element of the trap itself. Akram (2014, 2016a, 2016b) examined Japan's experience directly, documenting that low and falling interest rates coexisted with weak investment and persistent output gaps, and argued that raising effective demand is the appropriate policy solution for recovery.

A parallel literature has examined the international dimension of the zero or effective lower bound. Caballero, Farhi, and Gourinchas (2021) modeled how a global shortage of safe assets can push multiple economies toward the zero or effective lower bound simultaneously, transforming unilateral policy responses (such as currency depreciation) into beggar-thy-neighbor policies that merely redistribute, rather than resolve, global demand shortfalls. This literature is skeptical of the Bernanke-style prescription of exchange rate depreciation as an escape route, since it presumes that trading partners are not themselves constrained by the same zero or effective lower bound dynamics.

Finally, Schumpeter's ([1943] 1976) theory of creative destruction, though not originally framed in terms of a liquidity trap, has been invoked by some post-Keynesian and structuralist economists to argue that demand-side remedies alone cannot restore an economy's growth trajectory once a trap has set in; renewed profit opportunities from new industries and technologies are needed to lift the marginal efficiency of capital, independent of the interest rate. Taken together, this literature suggests three broad camps: (1) a mainstream literature, such as Krugman (1998a, 1998b), Bernanke (2000, 2002), Eggertsson (2006, 2008, 2012), and

Eggertsson and Krugman (2012), in the monetarist/New Keynesian tradition that attributes the trap to expectations and credibility, and prescribes aggressive monetary commitment; (2) Keynes and the post-Keynesian tradition, such as Robinson (1937), Kregel (1998, 2000, 2011, 2014), and several others, that locates the trap in liquidity preferences, uncertainty, and duration risk, and prescribes fiscal and yield-curve interventions; and (3) a structuralist and Schumpeterian tradition that emphasizes the supply-side conditions and revival of entrepreneurial innovation for renewed investment. This paper draws on the second and third strands of the literature to argue that overcoming a liquidity trap requires policies that go well beyond monetary accommodation.

SECTION III. INTEREST RATE DYNAMICS

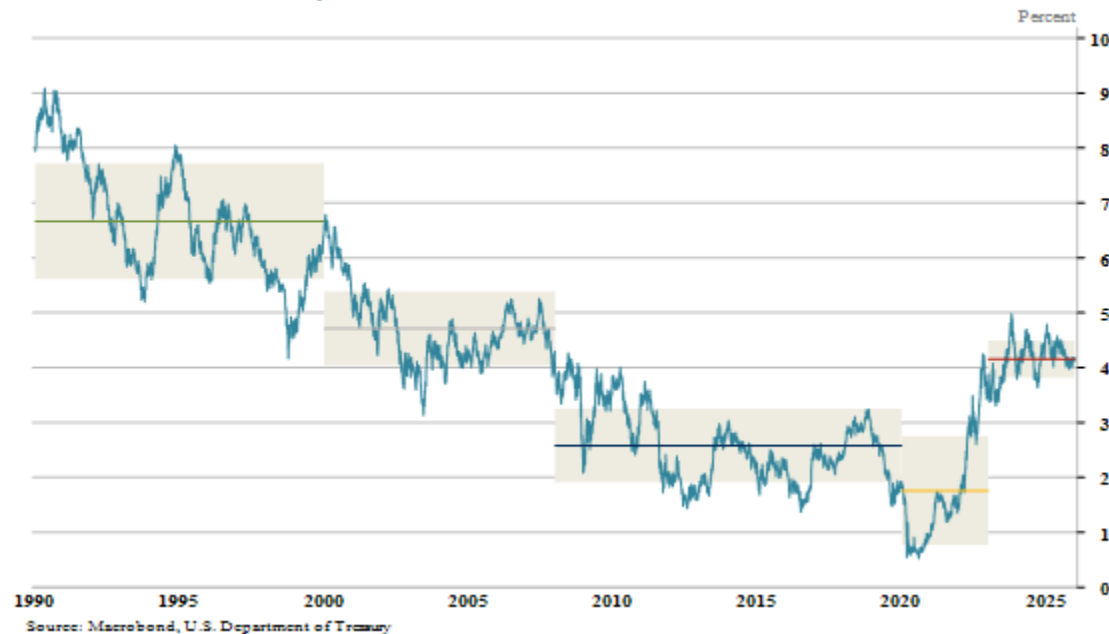
It is useful to examine the stylized facts concerning the dynamics of long-term interest rates. In the major advanced capitalist economies and China, long-term interest rates, as given by the evolution of the yields on benchmark 10-year Treasury securities, progressively declined between 1990 and 2025. The figures below show the evolution of benchmark government bond yields in the United States (figure 1), Japan (figure 2), the United Kingdom (figure 3), Germany (figure 4), France (figure 5), Italy (figure 6), Canada (figure 7), and China (figure 8), with most exhibiting an eerily similar pattern of steady declines in long-term interest rates. Long-term interest rates in the advanced countries reached historically low levels beginning in 2008 through 2022. Since 2022, long-term interest rates have gradually risen in response to central banks' higher policy rates and higher inflation.

The case of Japan is slightly different (Akram and Li 2020a, 2020b), where long-term interest rates fell steadily through the 1990s, particularly in the second half of the decade, remaining low through the 2000s, but falling further between 2010 and 2015. With the advent of quantitative and qualitative monetary easing (QQME), the policy rate was negative from early 2016 to 2023, while long-term interest rates were nearly zero and occasionally negative during much of that period (2016–21).

China, which is the only emerging market among the economies discussed here, displays somewhat different interest rate dynamics, as shown in figure 8. Between 2002 and 2019, long-term interest rates averaged 3.9 percent, but they varied markedly from year to year. However, since 2020, interest rates there have declined, averaging 2.9 percent between 2020–23, and 2 percent between 2024–25.

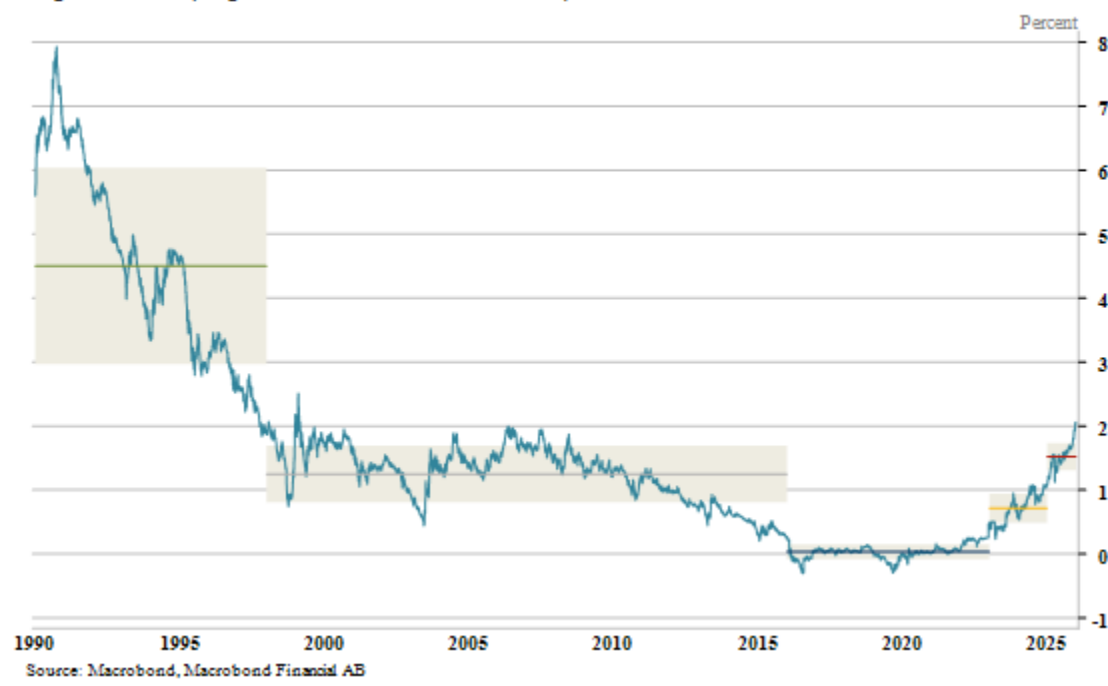
Figure 1. The Evolution of 10-year US Treasury Note Yields, 1990–2025

United States, Treasury Note, 10 Year, Yield, %



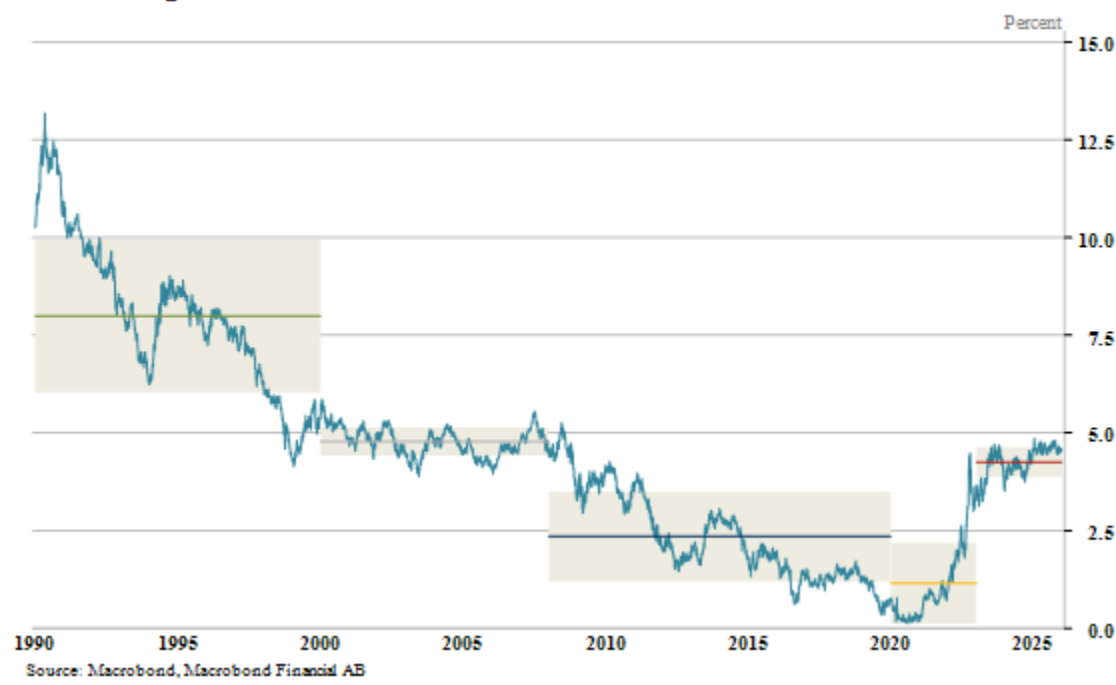
Source: Macrobond, U.S. Department of Treasury.

Figure 2. The Evolution of 10-year Japanese Government Bond Yields, 1990–2025
Japan, JGB (Japanese Government Bond), 10 Year, Yield, %



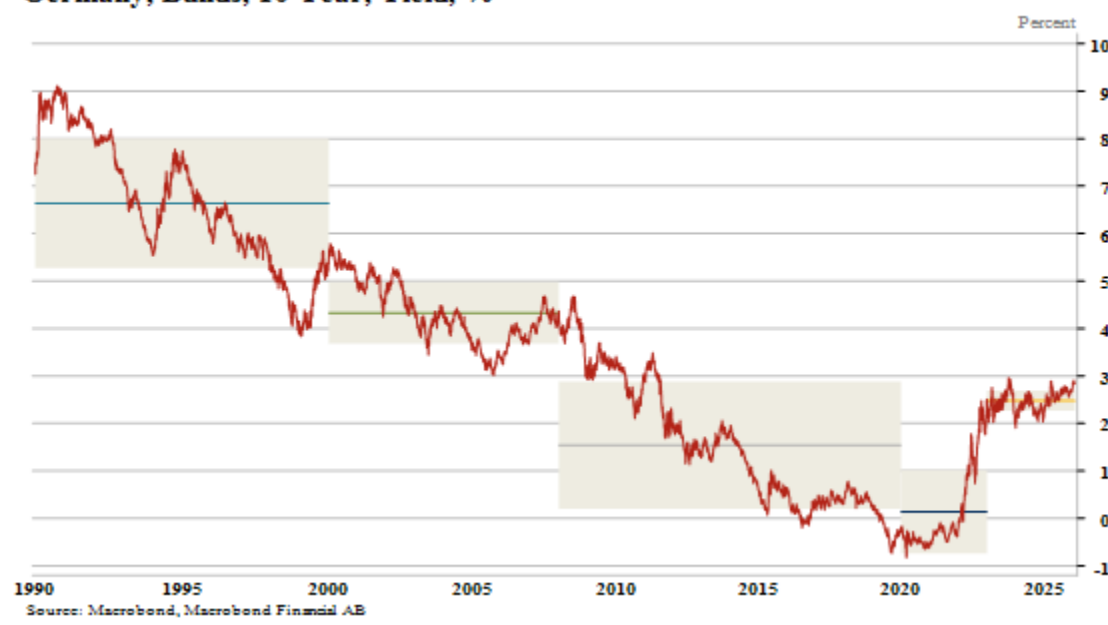
Source: Macrobond, Macrobond Financial AB.

Figure 3. The Evolution of 10-year UK Gilts Yields, 1990–2025
United Kingdom, Gilts, 10 Year, Yield, %



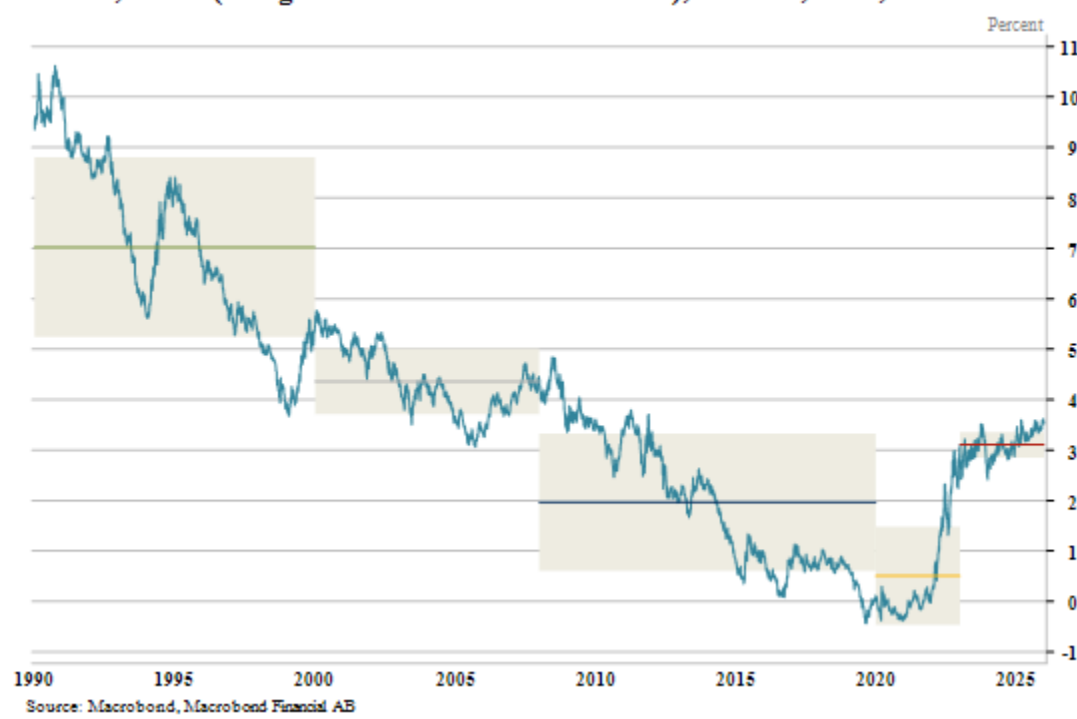
Source: Macrobond, Macrobond Financial AB.

Figure 4. The Evolution of 10-year German Bund Yields, 1990–2025
Germany, Bunds, 10 Year, Yield, %



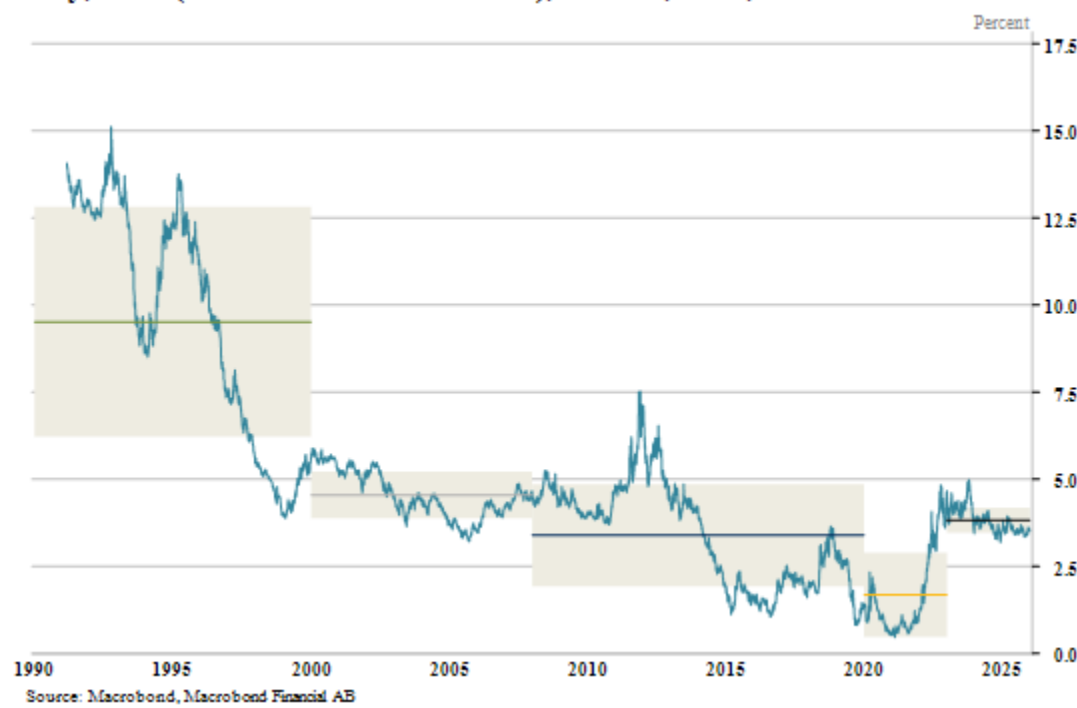
Source: Macrobond, Macrobond Financial AB.

Figure 5. The Evolution of 10-year French OAT Yields, 1990–2025
France, OATs (Obligations Assimilables du Tresor), 10 Year, Yield, %



Source: Macrobond, Macrobond Financial AB.

Figure 6. The Evolution of 10-year Italian BTP Yields, 1990–2025
Italy, BTPs (Buoni del Tesoro Poliennali), 10 Year, Yield, %



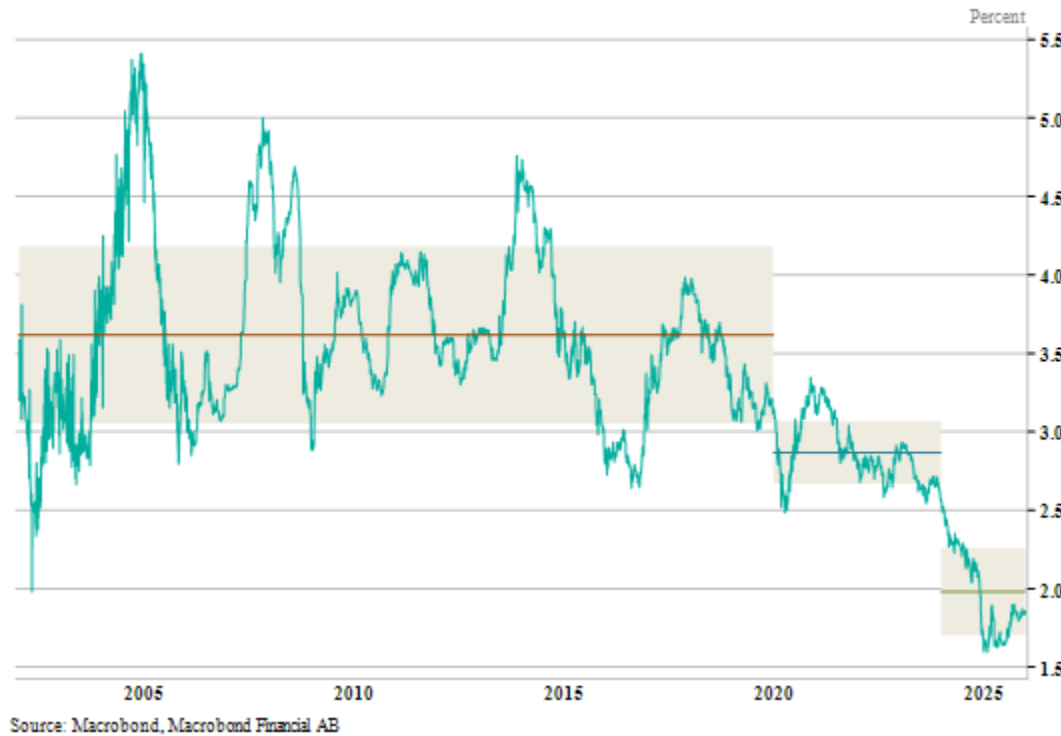
Source: Macrobond, Macrobond Financial AB.

Figure 7. The Evolution of 10-year Canadian Government Bond Yields, 1990–2025
Canada, Canada Bond, 10 Year, Yield, %



Source: Macrobond, Macrobond Financial AB.

Figure 8. The Evolution of 10-year Chinese Government Bond Yields, 2002–25
China, China Government Bonds, 10 Year, Yield, %



Source: Macrobond, Macrobond Financial AB.

SECTION IV. KRUGMAN'S AND BERNANKE'S ARGUMENTS

Krugman (1998a, 1998b) and Bernanke (2000, 2002) both emphasize the importance of continuous monetary easing to neutralize a liquidity trap. In their view, the main cause of a liquidity trap is that the real interest rate is too high to induce business investment and spending. Hence, the solution is to undertake continuous monetary easing to: (1) lower the nominal interest rate and (2) raise inflationary expectations. These measures will cause real interest rates to decline.² In their approaches, the remedy comes primarily from monetary easing, which they hold will lower nominal interest rates and raise inflationary expectations.

² The real interest rate is the difference between the nominal interest rate and inflation expectations, $r = i - \pi^E$, where r is the real interest rate, i is the nominal interest rate, and π^E is inflation expectations.

Based on the quantity theory of money, $MV = PQ$, where M is a monetary aggregate, V is the velocity of money, P is the price of goods, and Q is the economy's real output, they argue that monetary easing is essential for reviving inflation. Advocates of the quantity theory of money hold that an increase in base or high-powered money (notes + reserves) increases the money supply and, in turn, an increase in the money supply (monetary aggregates) leads to a higher price level. The proponents of the quantity theory hold that real output remains at some steady state and that the velocity of money is also a constant. Thus, other things being constant, an increase in the monetary aggregate leads to an increase in the price level. Likewise, steady and continuous growth in the monetary aggregate results in an orderly inflation regime.

The view that sustained monetary easing generates steady inflation and inflation expectations rests on the assumption that an increase in high-powered money raises the monetary aggregate, which raises the price level. This relationship can be expressed as, $H \uparrow \Rightarrow M \uparrow \Rightarrow P \uparrow$, where H is high-powered money, M is a monetary aggregate, and P is the price level.

Given that in a low interest rate environment, money and bonds are nearly perfect substitutes, for Krugman (1998a), the solution lies in the central bank committing to future inflation. The same view is reiterated in Krugman (1998b), where he emphasizes deflationary expectations as the decisive determinant of Japan's liquidity trap, while dismissing their aging population, corporate leverage, and overregulation as consequential factors in the country's growth slowdown.

Because agents expect accommodative monetary policy to be reversed, Eggertsson (2006, 2008, 2012) also regards a central bank's credible commitment to generating inflation as the main solution to liquidity traps, which, in his view, are self-reinforcing. Besides the central bank's commitment to regenerating inflation, he calls for the central government to issue nominal government debt, cut taxes, and purchase financial and real assets.

For Bernanke (2000), the solution to a liquidity trap lies not only in lowering the policy rate and credibly committing to a low policy rate in the foreseeable future but also undertaking nontraditional monetary policy that could spur inflation. He urges the use of large-scale asset

purchases, exchange rate depreciation, and monetary-financed fiscal expansion as remedies. His later work (Bernanke 2002) echoes the same remedies.

Operating under the assumption that monetary accommodation will lead to higher inflationary expectations, and higher inflationary expectations mean that the real interest rate will be low, Krugman (1998a, 1998b) and Bernanke (2000, 2002) promote a credible commitment to a continuous increase in the money supply and an expansion of the central bank's balance sheet. They contend such measures will increase inflation expectations, lower nominal and real interest rates, and encourage business investment in structures, equipment, and software, as well as stimulate residential and commercial construction activity.

But if the nominal interest rate cannot be reduced below some "lower bound," then the central bank ought to engage in the purchase of long-duration assets and reduce long-term interest rates, as low nominal and real interest rates will boost investment. Moreover, they hold, like Arthur Pigou (1943), that the wealth effect due to higher asset prices can boost consumer spending.

Krugman (1998b, 142) has stated that: "... a liquidity trap involves a kind of credibility problem. A monetary expansion that the market expects to be sustained (that is, matched by equiproportional expansions in all future periods) will always work, whatever structural problems the economy might have; if monetary expansion does not work—if there is a liquidity trap—it must be because the public does not expect it to be sustained." However, as will be argued later, it is unclear if sustained and continuous monetary expansion always works to bring about inflation or foster lending or economic activity.

In a similar vein, Bernanke (2002) argues as follows: "Indeed, under a fiat [...] money system, a government (in practice, the central bank in cooperation with other agencies) should always be able to generate increased nominal spending and inflation, even when the short-term nominal interest rate is at zero." Citing the example of Japan's liquidity trap of the 1990s, Bernanke (2002) assesses that Japan's failure to generate inflation was not due to "technical infeasibility" of the central bank's balance sheet expansion but rather due to a "political deadlock" in the country's institutions and body politic.

In essence, Krugman's (1998a, 1998b) and Bernanke's (2000, 2002) strategy for overcoming a liquidity trap can be summarized as follows: the central bank should be engaged in inflation targeting, making a clear commitment to achieving inflation targets by lowering nominal interest rates through monetary expansion to lift prices; a commitment to continuous monetary expansion will provide an impetus to inflationary expansion.

Another aspect of their strategy, particularly Bernanke's (2002), is that monetary expansion will lower the exchange rate, boosting net exports and effective demand. In the Krugman–Bernanke strategy, the main emphasis is on using continuous monetary expansion to lower real interest rates and boost economic activity. To be fair, neither Krugman (1998a, 1998b) nor Bernanke (2000, 2002) rule out monetary-fiscal cooperation and tax cuts, but continuous monetary expansion is the Prince of Denmark and other policies are at best Horatio, if not merely attendant lords, in their play. Thus, monetary policy rules the roost.

Some Reservations

But is monetary expansion, even if it is backed by political firepower, enough to reignite economic activity, boost investment, and spur inflation back to its target? If so, then what explains the sustained undershooting of inflation targets and subpar economic performance by advanced countries? Neither the evidence nor the theoretical basis of the approach advocated by Krugman (1998a, 1998b), Eggertsson (2006, 2008), and Bernanke (2000, 2002) is compelling and there are ample reasons to express reservations and caveats.

A central bank can lower its policy rates (interbank target rate, deposit rate, refinancing rate, and so forth) and it can expand its balance sheet by purchasing assets, but an increase in base money may not result in an increase in the monetary aggregate. More importantly, because banks and other financial institutions only provide financing when it is worthwhile and profitable to do so, a central bank's balance sheet expansion does not *necessarily* lead to credit expansion. Loan officers who follow their fiduciary responsibilities are unlikely to lend unless businesses have convincing projects that will not only cover costs, but also generate sales, revenue, and profit.

Central banks that issue their own currency and have a flexible exchange rate regime can control interest rates and buy anything in domestic currency, on the condition that it is permitted by law. Hence, such central banks can expand their balance sheet, lower long-term interest rates, and raise asset prices. However, the effect of such asset purchases may not be sufficient to increase consumption or investment. In fact, the evidence that reducing the nominal interest rate as low as possible induces business investment is not always that convincing. Entrepreneurs will invest when the expected marginal efficiency of capital is greater than the rate of interest. But the marginal efficiency of capital depends on effective demand and expectations of revenue growth and profits—if aggregate demand is tame, low nominal and real interest rates will not be enough to prompt entrepreneurs to invest.

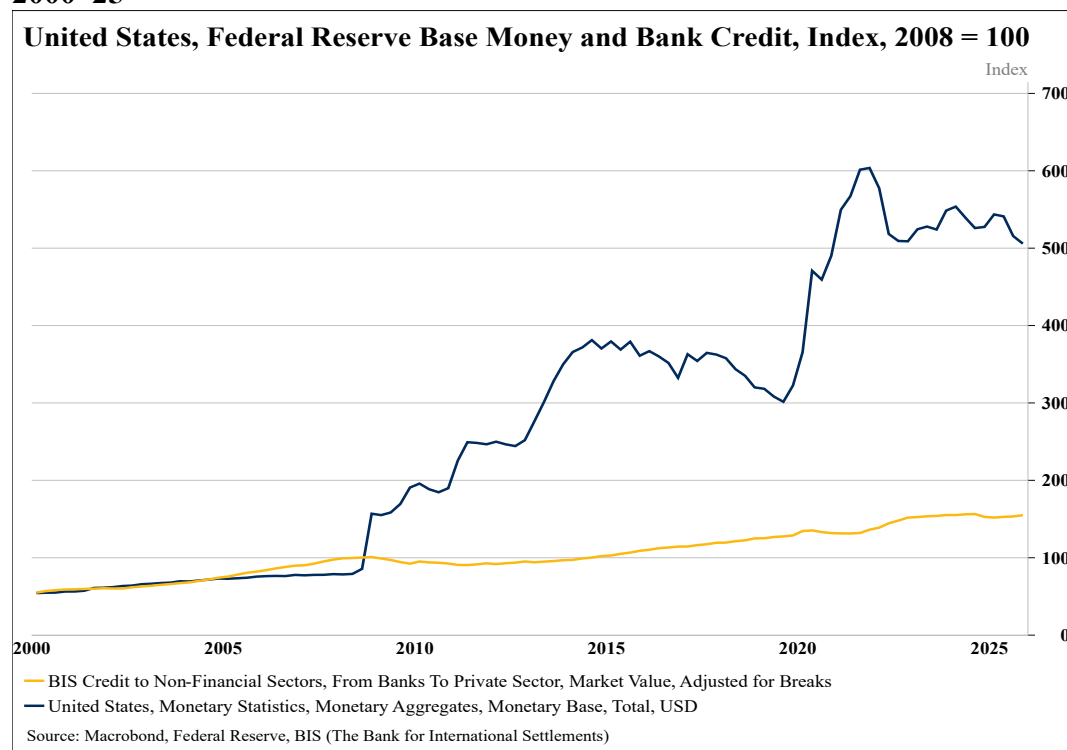
A central bank's decision to lower interest rates and expand its balance sheet may also cause exchange rate depreciation, as Bernanke (2002) notes. Indeed, Bernanke advocates monetary expansion and a concomitant exchange rate depreciation as a means for boosting net exports. However, the effect of the currency depreciation on aggregate demand may turn out to not be favorable. For a depreciation to boost net exports, the Marshall–Lerner condition states that the sum of the absolute values of the export and import demand elasticities must exceed one. The increase in export quantities and decrease in import quantities must be large enough to outweigh the depreciation's price effect. If not, then depreciation can worsen the trade balance, as import spending may rise more than the fall in import value and export revenue would not be sufficient to offset the shortfall. There can be a short-term deterioration of net exports due to long-term contracts, persistence of purchasing patterns, various institutional rigidities that take considerable time to adjust, known as the J-curve effect. Some countries may improve their net exports through exchange rate depreciation, whereas others may not.

When the global economy is trapped in stagnation, every country undertaking such currency depreciation would entail a currency war. Caballero, Farhi, and Gourinchas's (2021) insight on actual and prospective currency wars at the zero lower bound of the policy rate is quite relevant as an apt rejoinder to Bernanke's (2002) argument that currency depreciation is a suitable strategy for each individual country to overcome a liquidity trap.

In a stagnant global economy, there is a shortage of safe assets, which pushes interest rates toward the zero lower bound. When interest rates can no longer adjust, global output becomes the primary adjustment margin, leading to recessions. Countries with the most-severe asset shortages run current account surpluses, effectively “exporting” their recession to trading partners, as they pursue a “beggar-thy-neighbor” policy. The arguments articulated in Caballero, Farhi, and Gourinchas (2021) weaken Bernanke’s (2002) case for exchange rate depreciation as a strategy for overcoming a liquidity trap, particularly when the global economy faces a deep, worldwide recession. Instead of competitive currency depreciation, Caballero, Farhi, and Gourinchas (2021) recommend various policy measures—such as the issuance of “safe” public debt, helicopter drops of money, increases in government spending, and support for private securitization—as a positive-sum strategy that can stimulate output in all countries.

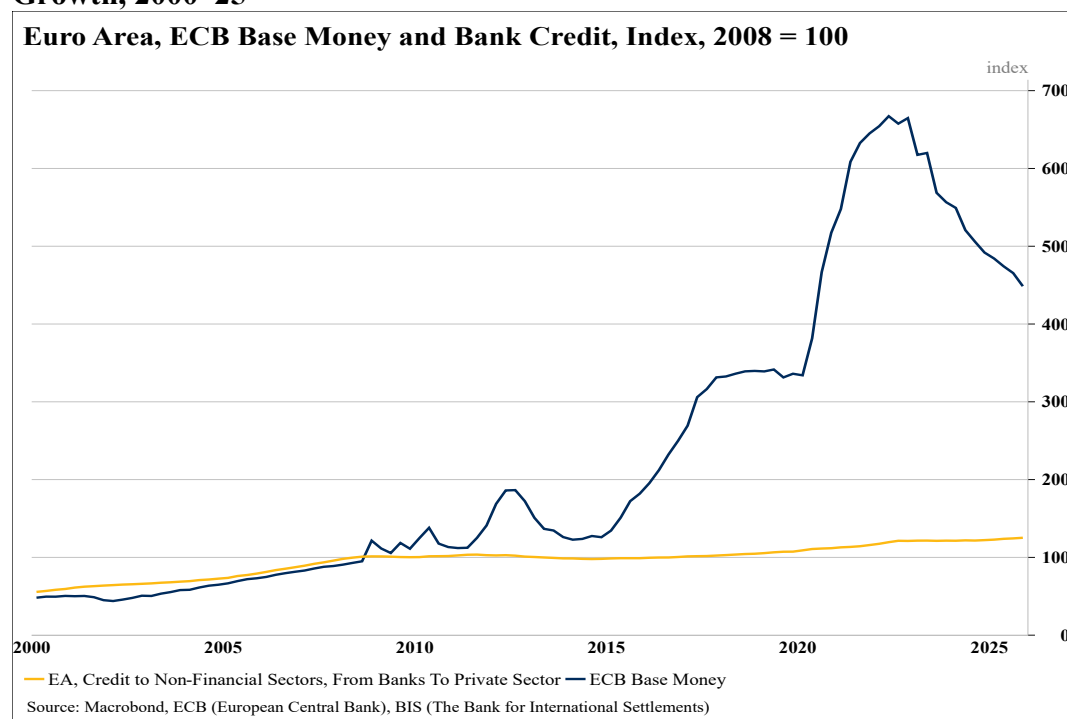
Bernanke advocates large-scale asset purchases for two reasons. First, it lowers long-term nominal interest rates. Second, as it boosts asset prices, it increases households’ and firms’ net worth, hence, it would increase households’ consumer spending and firms’ business fixed investment. This echoes Pigou’s (1943) view that the real-balance effect may allow escape from a liquidity trap. However, the experience of advanced capitalist countries does not seem to warrant the conclusion that the real-balance effect is strong enough to overcome a deep slump. Long ago, Irving Fisher (1932, 1933) noted that during a slump, deflating prices raise the real burden of debt for firms and households, prompting rising bankruptcies, which can lead to adverse contagion and possibly a protracted financial crisis.

Figure 9. The Evolution of the Federal Reserve's Balance Sheet and Banks' Credit Growth, 2000–25



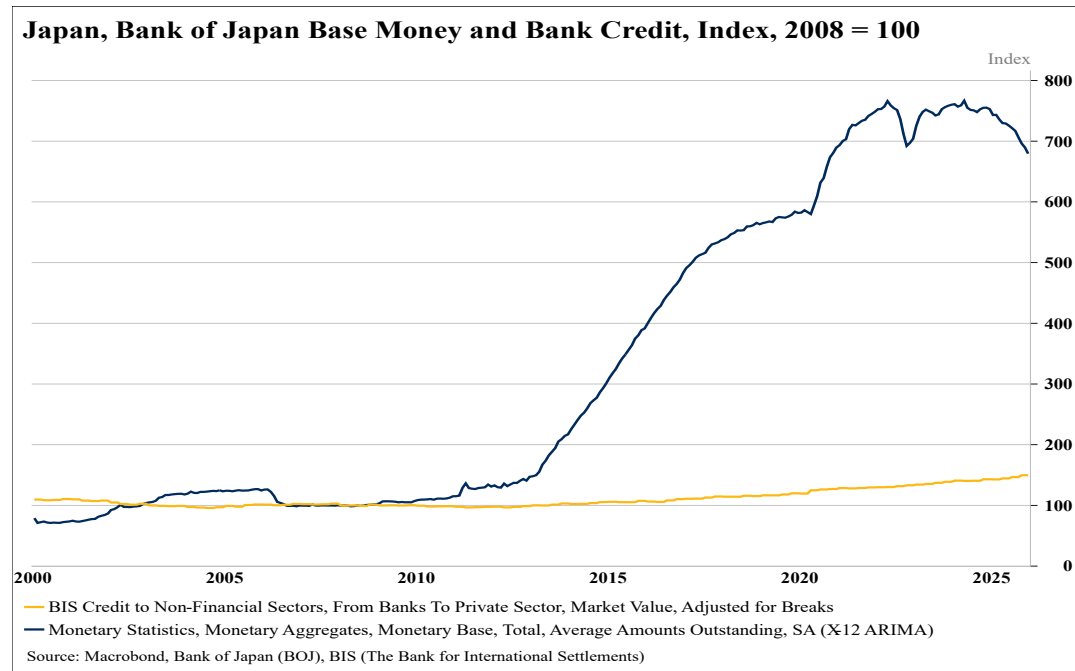
Source: Macrobond, Federal Reserve, BIS (The Bank for International Settlements).

Figure 10. The Evolution of the European Central Bank's Balance Sheet and Banks' Credit Growth, 2000–25



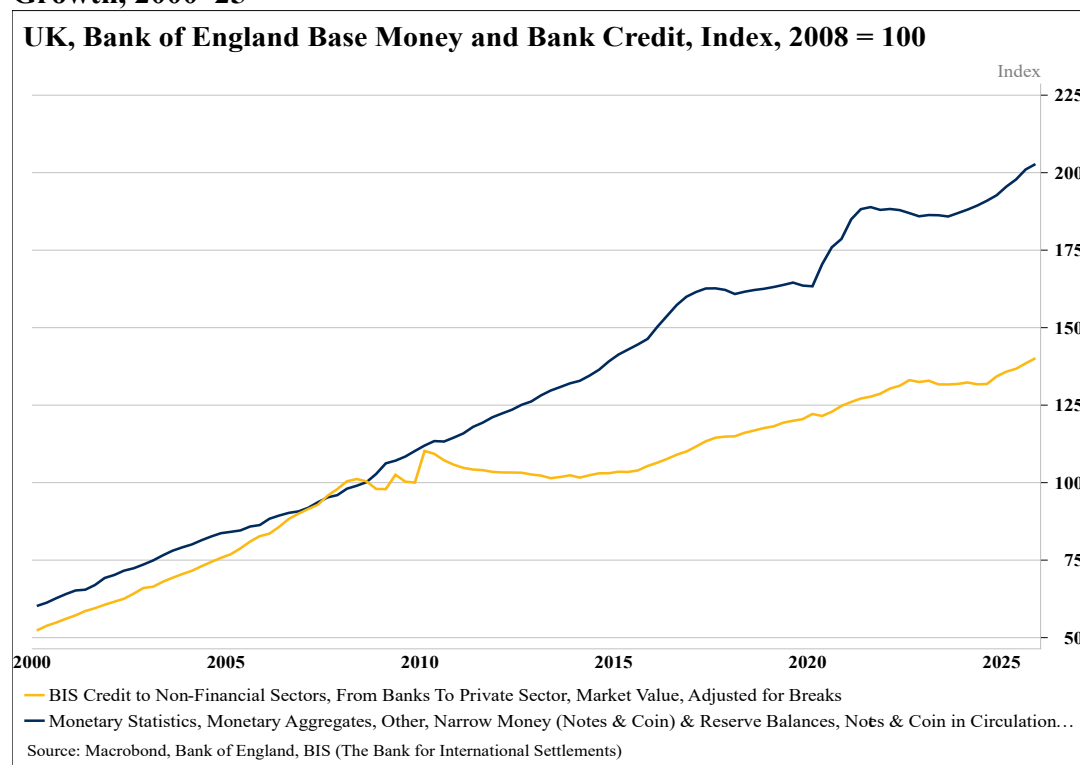
Source: Macrobond, ECB (European Central Bank), BIS (The Bank for International Settlements).

Figure 11. The Evolution of the Bank of Japan's Balance Sheet and Banks' Credit Growth 2000–25



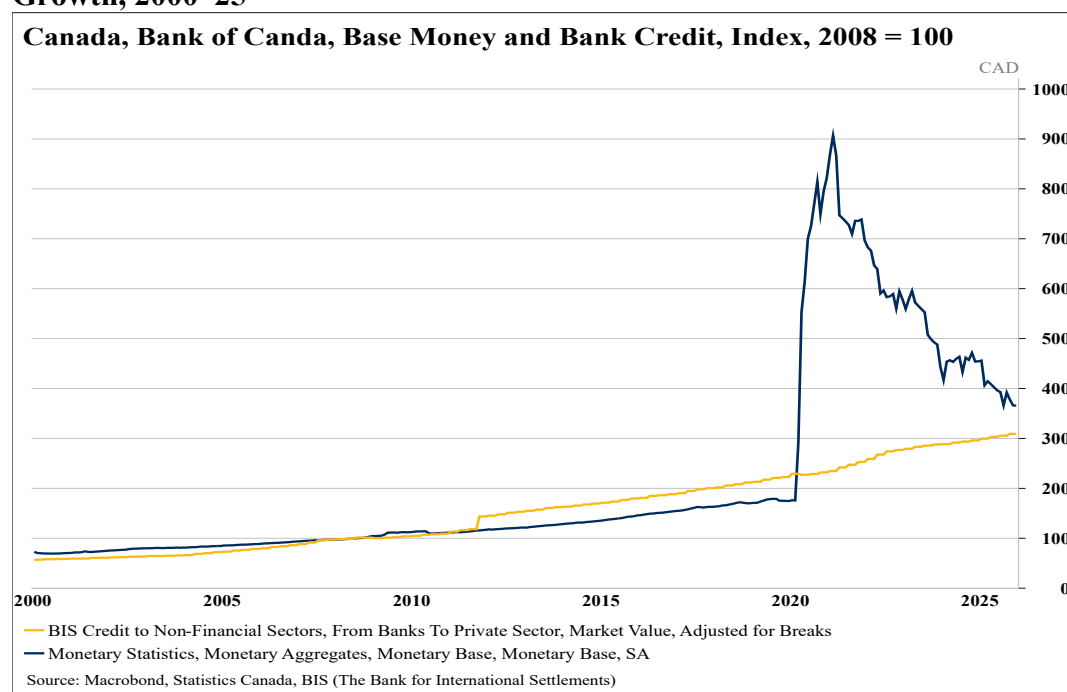
Source: Macrobond, Bank of Japan (BOJ), BIS (The Bank for International Settlements).

Figure 12. The Evolution of the Bank of England's Balance Sheet and Banks' Credit Growth, 2000–25



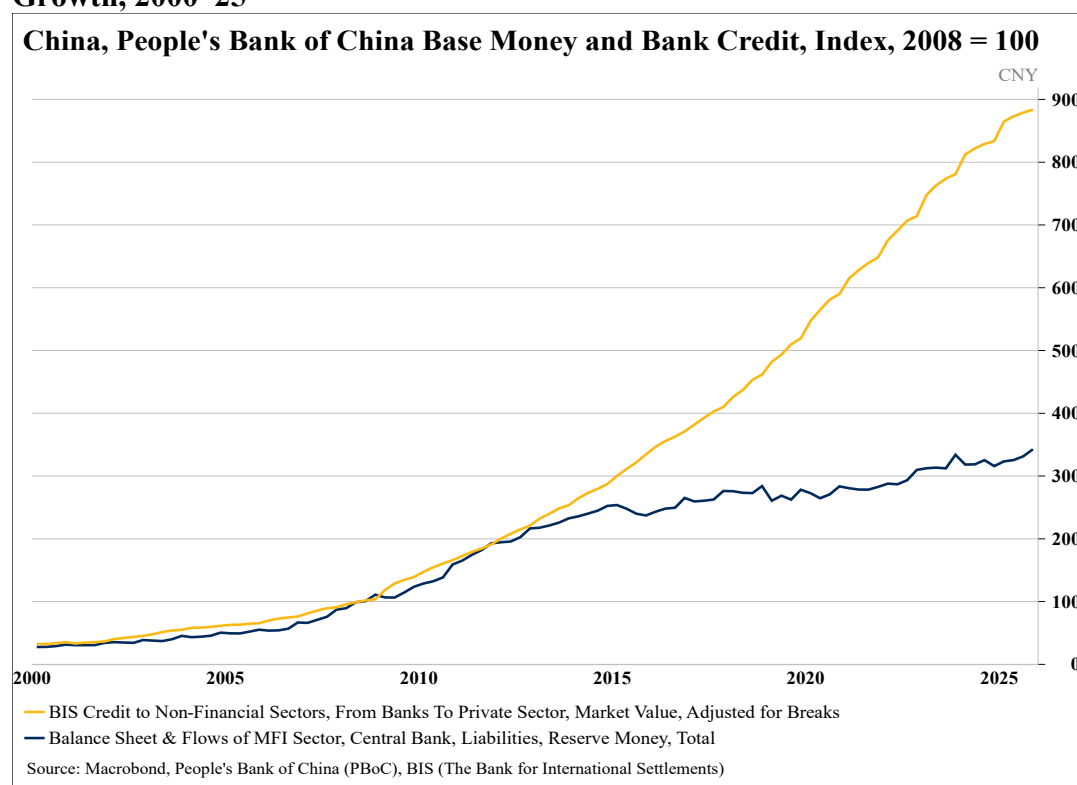
Source: Macrobond, Bank of England, BIS (The Bank for International Settlements).

Figure 13. The Evolution of the Bank of Canada's Balance Sheet and Banks' Credit Growth, 2000–25



Source: Macrobond, Statistics Canada, BIS (The Bank for International Settlements).

Figure 14. The Evolution of the People’s Bank of China’s Balance Sheet and Banks’ Credit Growth, 2000–25



Source: Macrobond, People’s Bank of China (PBoC), BIS (The Bank for International Settlements).

Central Bank Balance Sheets and Banks’ Credit Growth

Post-2008, the Federal Reserve’s balance sheet expanded, nearly doubling within months, yet bank credit stagnated and slightly contracted during 2009–11. In 2020, the Federal Reserve expanded its balance sheet markedly in response to financial and economic turmoil during the global pandemic. The 2020 episode also reinforces that despite another near doubling of the central bank’s balance sheet, proportional credit growth did not follow, suggesting banks extend financing based on profit expectations and borrower viability, not reserve availability on the central bank’s balance sheet. The same holds for most other central banks in advanced economies.

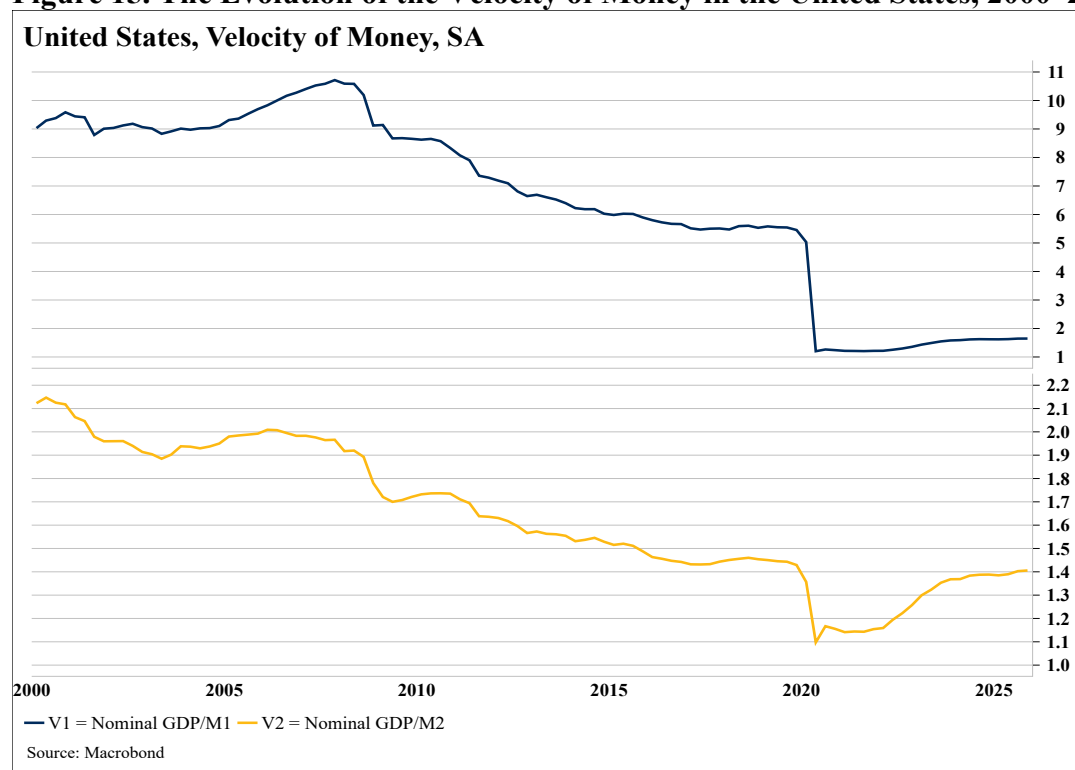
This is evident when the stylized facts of balance sheet expansion and banks’ credit growth in several major advanced economies, including the United States, the euro area, Japan, and the United Kingdom, are examined.

Is the Velocity of Money Constant?

The claim that a money supply expansion unambiguously translates into a price level rise implicitly assumes that the velocity of money is constant. Since $MV = PQ$, it follows that $\uparrow M \Rightarrow \uparrow P$, assuming that output is fixed in the long run and the velocity of money is a constant.

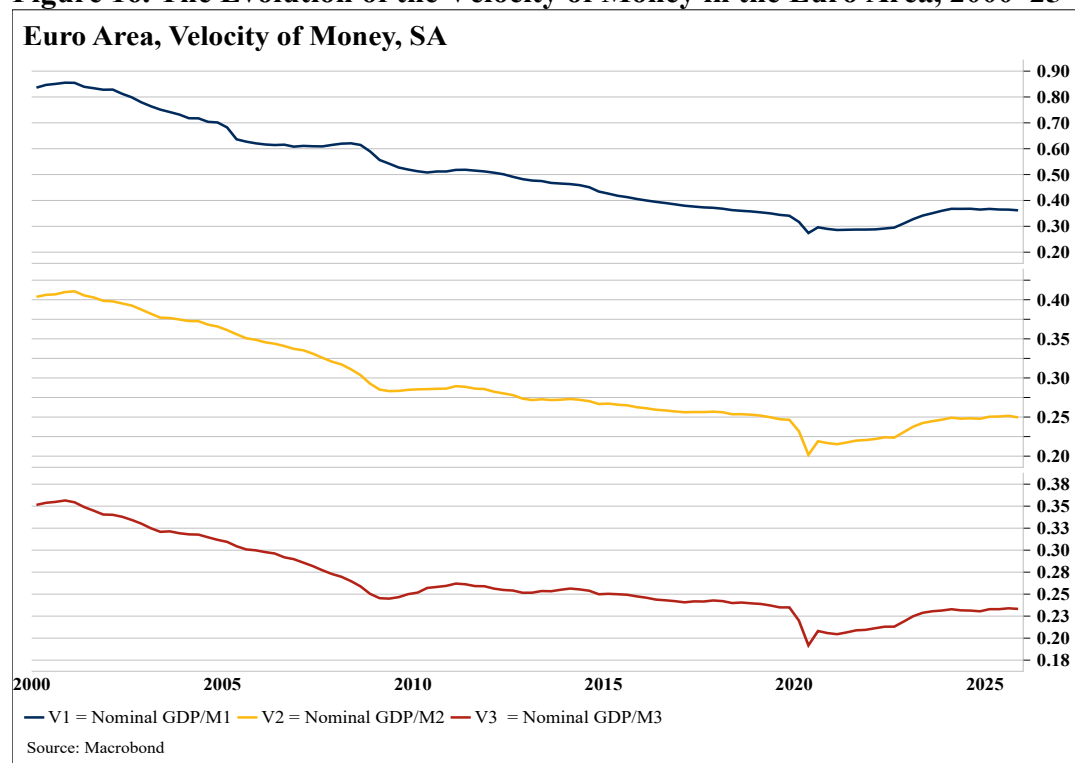
The data, however, clearly suggest otherwise. The velocity of money has experienced a structural decline since the 2008 financial crisis, remaining suppressed for over a decade in most advanced economies, as demonstrated by declines in: (1) the United States (figure 14), (2) the euro area (figure 15), (3) Japan (figure 16), (4) the United Kingdom (figure 17), and (5) Canada (figure 18).

Figure 15. The Evolution of the Velocity of Money in the United States, 2000–25



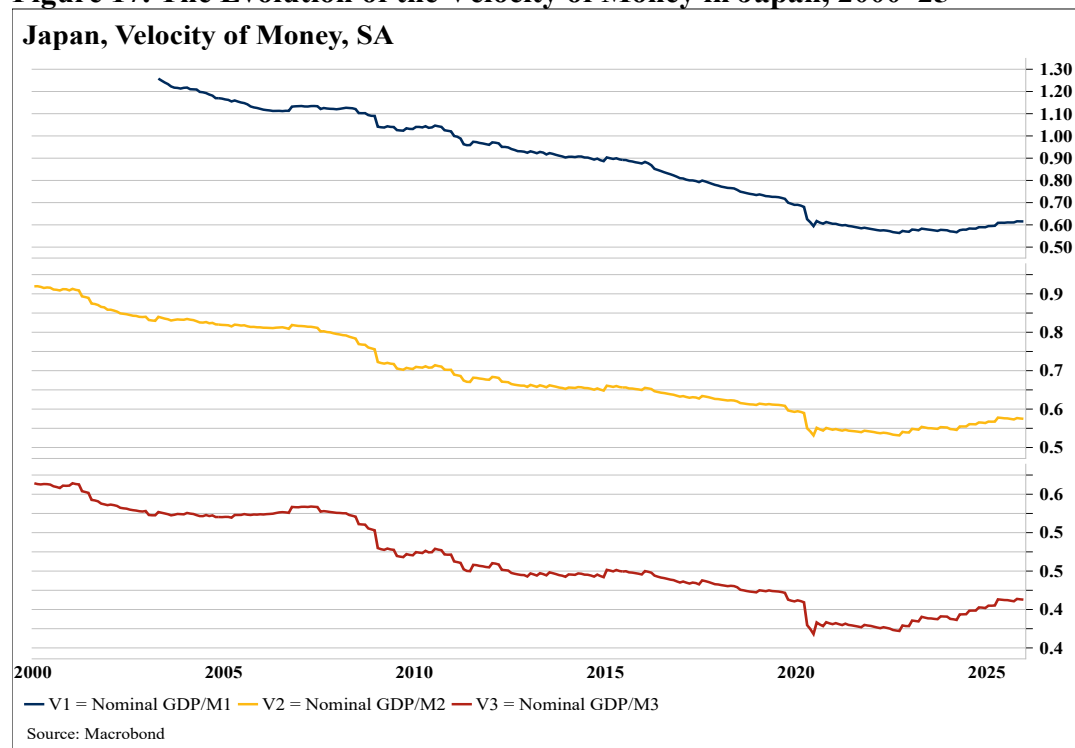
Source: Macrobond.

Figure 16. The Evolution of the Velocity of Money in the Euro Area, 2000–25



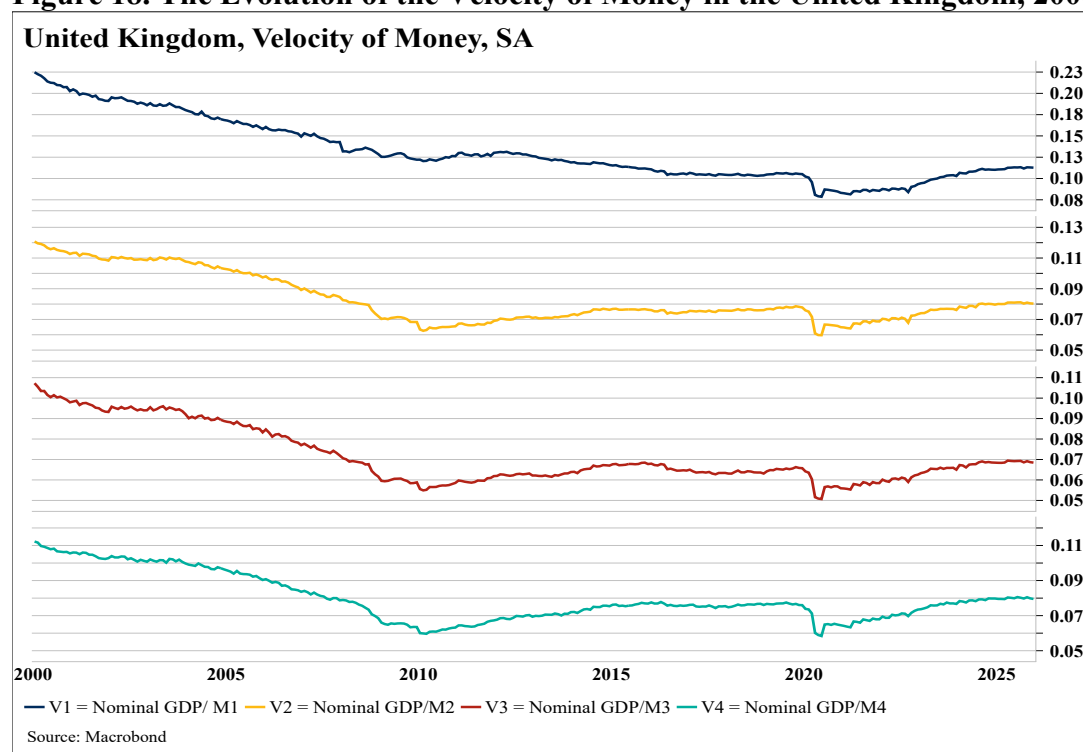
Source: Macrobond.

Figure 17. The Evolution of the Velocity of Money in Japan, 2000–25



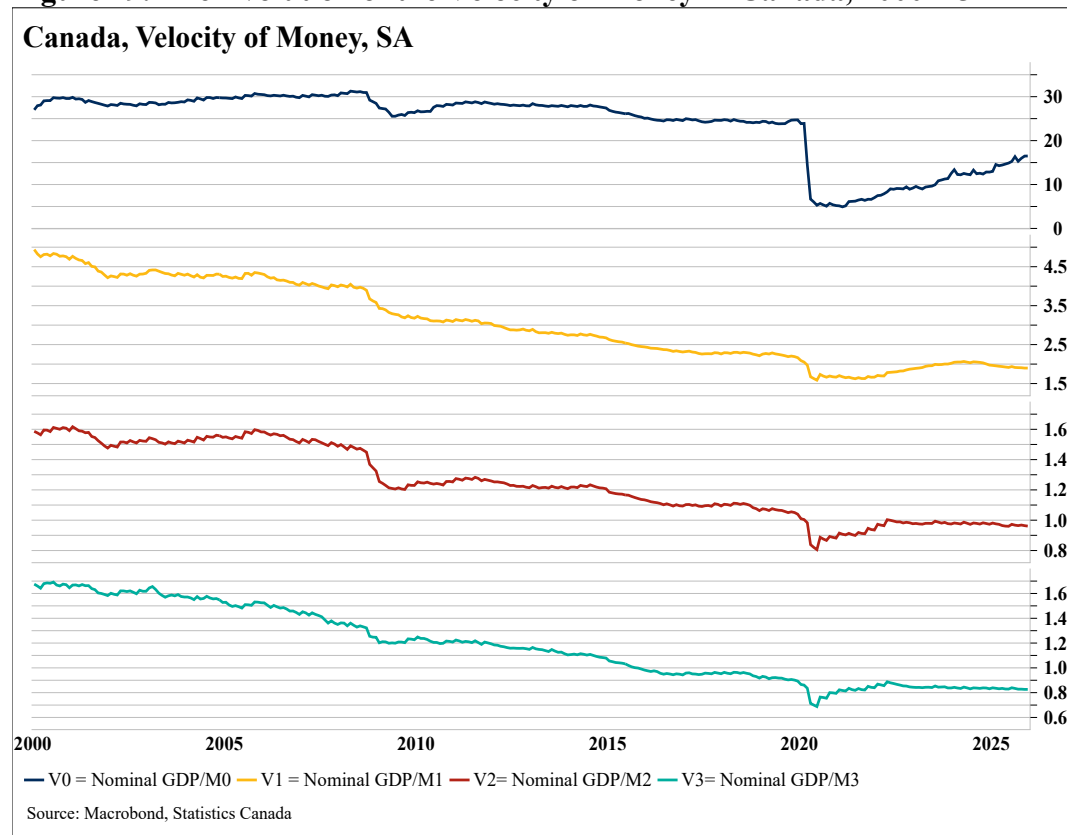
Source: Macrobond.

Figure 18. The Evolution of the Velocity of Money in the United Kingdom, 2000–25



Source: Macrobond.

Figure 19. The Evolution of the Velocity of Money in Canada, 2000–25



Source: Macrobond, Statistics Canada.

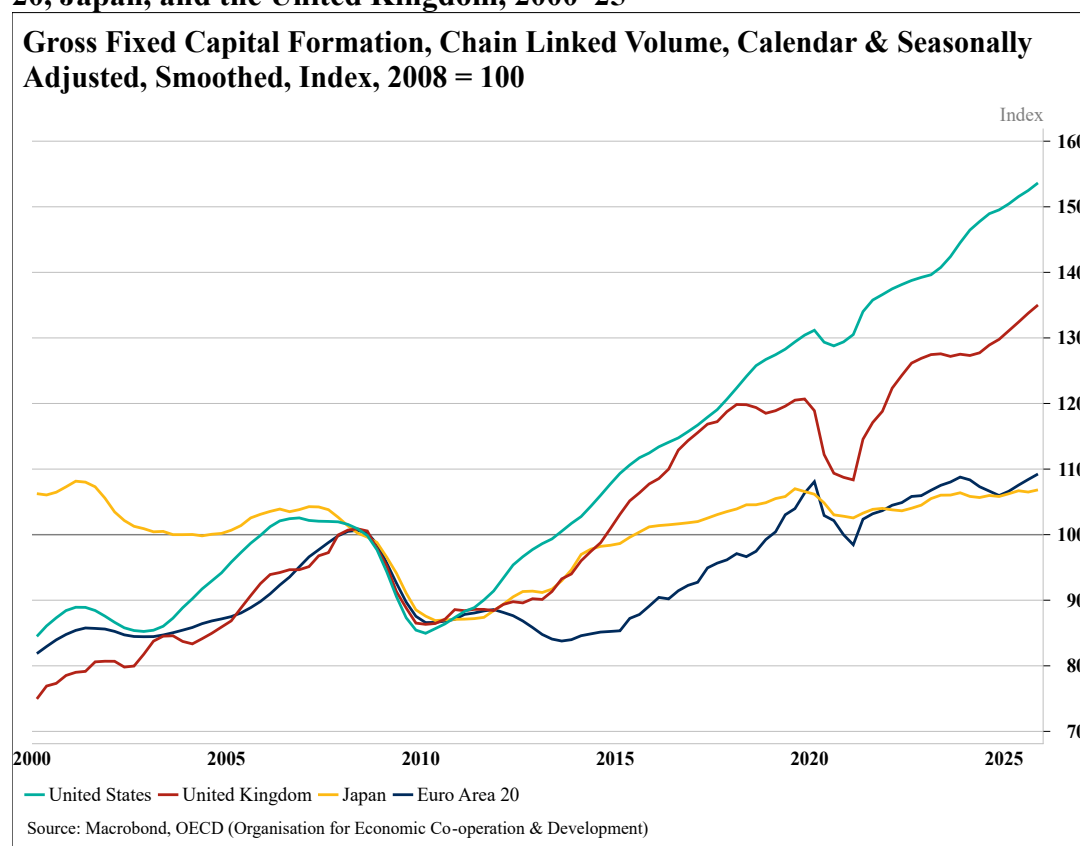
Robinson's (1937) critique of the quantity theory of money retains its validity in contemporary discussions, including the implicit acceptance of its axioms in Krugman (1998a, 1998b) and Bernanke (2002). Robinson (1937, 77) stated the following:

No one who understands the rules of logic ever expected a truism, such as $MV = PT$, to tell us anything that we do not know without it, but in inexperienced hands the Quantity Equation can lead to great confusion. There are two main criticisms on the habits of thought which it fosters. First, it leads people to discuss changes of prices without making the vital distinction between a change due to a change on the side of demand, such as the rise in prices which accompanies an increase in investment or a reduction in thriftiness, and a change of prices due to a change on the

side of supply, such as the rise in prices which is produced by a rise in money wages. Second, it leads people to attribute some kind of direct influence upon prices to changes in the quantity of money, so that some writers seem to suggest that bank-notes have feet, and run into the shops and bid up prices as soon as they are printed. Changes in the quantity of money are of the utmost importance, but their importance lies in their influence upon the rate of interest, and a theory of money which does not mention the rate of interest is not a theory of money at all.

There is little evidence that lowering nominal or real interest rates will induce business fixed investment, particularly when the economy is in a deep slump and investors' expectations about the economic outlook are bleak. Figure 20, below, provides a revealing illustration. Following the 2008 global financial crisis, investment continued to decline until 2010 in the United States, the United Kingdom, and the euro area, and until 2014 in Japan. The advanced countries took several years for business investment to exceed its 2008 levels: 2013Q3 in the United States, 2014Q4 in the United Kingdom, 2019Q1 in the euro area, and 2019Q3 in Japan. As of 2025, fixed capital formation was just 9 percent higher in the euro area and merely 7 percent higher in Japan, while in the United Kingdom it was 35 percent higher than in 2008. The United States fared better, with fixed capital formation 54 percent higher in 2025 than in 2008.

Figure 20. The Evolution of Gross Fixed Capital Formation in the United States, Euro Area 20, Japan, and the United Kingdom, 2000–25



Source: Macrobond, OECD (Organisation for Economic Co-operation & Development).

SECTION V. A KEYNESIAN APPROACH

Keynes's ([1936] 2007) analysis suggests that a liquidity trap originates from liquidity preference, capitalist economies' tendency toward operating below their potential and deviating markedly from full employment, and fundamental uncertainty about the future economic outlook. In such circumstances, lowering interest rates can prove to be futile or, at the very least, insufficient for reviving effective demand.

Keynes ([1936] 2007, 202) emphasizes that when interest rates are low, investors prefer to hold cash rather than bonds with duration risks because a small change in the interest rate could cause a substantial capital loss. He highlighted that “[e]very fall in r reduces the current earnings from illiquidity which are available as a sort of insurance premium to offset the risk of loss on capital

account, by an amount equal to the difference between the squares of the old rate of interest and new.”³ Hence, he warned that a low “rate of interest of (say) 2 percent leaves more to fear than to hope and offers, at the same time, a running yield which is only sufficient to offset a very small measure of fear” (Keynes [1936] 2007, 202). Explaining his shrewd observation is worthwhile because it is relevant to understanding liquidity traps. The price of a consol or perpetual bond, P , is $P = \frac{\lambda}{i}$, where λ is the coupon, and i is the nominal rate of interest. The modified duration of a consol is $\hat{D} = -\frac{1}{P} \frac{dP}{di} = \frac{1}{i}$. The convexity of a consol is $\hat{C} = \frac{1}{P} \frac{d^2P}{di^2} = \frac{2}{i^2}$. This implies that the lower the nominal interest rate, the higher the modified duration and convexity of a consol bond, the price of which is much more sensitive to a small change in the nominal interest rate when the nominal rate is low than when it is high.

A bond’s price volatility is a function of its coupon, maturity, and initial yield. Duration captures the impact of all these variables in a single measure. Duration is the first derivative of price with respect to yield. Another way of thinking about duration is that it gives the future point in time at which, on average, an investor has received exactly half of the original investment in present-value terms. Duration is a linear estimate of a bond’s sensitivity to interest rates. However, this linear estimate is not accurate for large changes in the interest rate. Hence, convexity, which is the second derivative of the price with respect to yield, can be useful for measuring the sensitivity of a bond’s price to changes in the nominal interest rate. Both concepts can be expressed as given below:

$$\hat{D} = \frac{P_{-\Delta i} - P_{+\Delta i}}{2 \times P_0 \times \Delta i}$$

$$\hat{C} = \frac{P_{-\Delta i} + P_{+\Delta i} - 2 \times P_0}{2P_0 \times (\Delta i)^2}$$

³ In Keynes’s notation, r is nominal interest rates. In this paper, however, r is the real interest rate and i is the nominal interest rate.

Here Δi is the change in the nominal interest rate, P_0 is the initial price, $P_{+\Delta i}$ is the price when the nominal interest rate increases by Δi , and $P_{-\Delta i}$ is the price when the nominal interest rate decreases by Δi .

At low nominal interest rates, a consol's duration and convexity are quite high, whereas at high interest rates, they are low. Thus, at low nominal interest rates, a large change matters much more than at high nominal rates. Given this, investors may prefer to hold cash rather than bonds when nominal interest rates are low and the outlook is uncertain. Kregel (2000) notes: "[T]he lower the rate of interest, the more likely that [a] liquidity trap will be sprung, since the longer it takes to recoup the capital loss through higher interest rate earnings and thus the higher the probability there will be a reversal in interest rates."

A liquidity trap arises from fundamental uncertainty and generalized pessimism about the prospects of returns to capital and even capitalism itself. Although the central bank can and does control the complex of interest rates, as Keynes ([1936] 2007) held, lowering interest rates during a liquidity trap may be insufficient to prompt the desired business investment, expansion in output, and employment growth.⁴ Public policy should instead focus on raising the marginal efficiency of capital when investment spending, $\mathbb{I}$, is less than the $\mathbb{I}^*$ investment spending required to attain potential output.⁵ If the expected profits and expected sales are poor, and if the outlook for effective demand is not good and/or uncertain, businesses and investors will not expand production capacity. Thus, the "animal spirits" that motivate investors may not return even if the nominal interest rates are low (or even negative).⁶

Per Keynes, the goal of appropriate public policy is to restore animal spirits. He was skeptical that lowering nominal interest rates would enable an economy that is operating below its potential to return to its full capacity (Keynes [1936] 2007). He had earlier surmised that "[i]t

⁴ Kregel (2000) argued that Keynes ([1936] 2007) emphasized duration risk for investors. Thus, at very low nominal interest rates, investors fear capital losses on long-term bonds.

⁵ $\mathbb{I} \leq F(\mu^E, i) = \mathbb{I}^*$ where μ^E is the expected rate of profit and i is the nominal interest rate. $\mu^E = G(S^E)$, where the expected rate of profit depends on expected sales (effective demand).

⁶ When $\mu^E \geq i \Rightarrow \mathbb{I} = F(\mu^E, i) = \mathbb{I}^*$; $\mu^E < i \Rightarrow \mathbb{I} < F(\mu^E, i) = \mathbb{I}^*$. Likewise, $\mu^E \geq i$, employment $\mathbb{L} = \mathbb{L}^*$, that is, the economy is at full employment, $\mathbb{L}^*$, but otherwise there is unemployment and underutilization of labor resources such that $\mathbb{L} < \mathbb{L}^*$.

will require not merely passive movements of bank rates to lift us out of a depression of this order but a very active and determined policy,” including large-scale asset purchases (Keynes 1930), but subsequently was cautious about the effectiveness of the central bank’s policy action. Thus, he wrote that “[o]nly experience, ... can show how far management of the rate of interest is capable of continuously stimulating the appropriate volume of investment” (Keynes [1936] 2007, 164). Rather, a combination of public spending on infrastructure and human capital, direct public-sector employment and public works, tax cuts, and a favorable tax regime for research and development (R&D) could be needed to enhance effective demand and restore animal spirits and corporate profits.

Keynes ([1936] 2007) acknowledged that existing capitalist economies can exhibit nominal rigidities in wages and prices, but, contrary to the classical economists, he firmly rejected the view that such rigidities were the *primary* causes for output and employment chronically remaining below their potential for sustained periods. He argued as follows: “There is ... no ground for the belief that a flexible wage policy is capable of maintaining continuous full employment—any more than for the belief that an open market monetary policy is capable, unaided, of achieving this result. The economic system cannot be made self-adjusting along these lines” (Keynes [1936] 2007, 267).

The Keynesian view on what is to be done to surmount a liquidity trap can be reprised as follows. The central bank should stabilize the interest rate environment through a combination of lowering policy rates and short-term interest rates, making large-scale asset purchases, and yield curve control. However, these measures alone may not be sufficient. Policymakers should be willing to experiment to restore animal spirits, whether through Treasury yield curve stabilization or undertaking large-scale employment programs.

Keynes argued that public policy must create conditions under which the marginal efficiency of capital exceeds the interest rate so that businesses and entrepreneurs feel confident enough to invest, and he saw public-sector job creation as a vital step toward reducing unemployment and underemployment. A Keynesian program for overcoming a liquidity trap would enhance effective demand and restore animal spirits by embracing a program of public spending on

infrastructure and human capital development, direct public-sector employment, investment in public works, tax cuts (including reducing payroll taxes), and a favorable tax regime for R&D. Today's policymakers should be prepared to undertake expansionary fiscal policy, especially to boost public-sector employment and embrace public works projects that promote the common good.

Without endorsing Keynes's ([1936] 2007, 376) call for the euthanasia of the rentier, it is worth probing why Keynes ([1936] 2007, 206) advocated for low rates and some type of yield curve control to compress risk premiums. A central bank's commitment to "lower-for-longer" interest rates anchors the short end of the curve, while active management, through a long-term asset purchase program, dampens long-term interest rate volatility, fostering more certainty about the cost of capital for entrepreneurs; eliminating or reducing interest rate volatility provides corporations and entrepreneurs with the predictable discount rates required to undertake long-gestation capital expenditure.

Post-Keynesians' Perspectives: Monetary Policy Alone Cannot Overcome a Liquidity Trap

Building on Keynes (1932, [1936] 2007), Kregel (1998) argued that shifts in investors' outlooks play a significant role in determining employment and output. Kregel maintains that asset prices are shaped by heterogeneous expectations, liquidity preference, and the institutional structure of financial markets. In later work, Kregel (2011, 2014) maintained that during deep slumps, the central bank cannot reliably generate higher growth and employment simply by reducing the policy rate or short-term interest rates, nor through large-scale asset purchases, as such measures tend instead to stimulate mortgage refinancing and boost equity prices rather than foster productive investment. Kregel (2014) emphasized that Keynes himself had revised, if not repudiated, his earlier belief—expressed in the *Treatise*—that aggressive interest rate cuts and large-scale asset purchases would suffice to revive investment. In the *General Theory*, Keynes ([1936] 2007) recognized that these monetary actions cannot overcome investors' bleak expectations or a persistently low marginal efficiency of capital. Instead, he called for policies that would directly create jobs, increase business investment, build investor confidence, and raise the marginal efficiency of capital through state action.

Wray and Nersisyan (2020) argue that monetarily sovereign countries—such as the United States, the United Kingdom, and Japan—do not face solvency or default risk on debt issued in their own currency. For such countries, the true constraints on fiscal policy are the availability of real resources and the potential for inflation, not the size of the national debt. The cost of government liabilities is determined primarily by the central bank’s interest-rate decisions, making fears of “bond vigilantes” driving yields sharply higher largely unfounded. Their assessment is that sovereign currency-issuing countries possess the operational and fiscal capacity to achieve full employment and to implement policies that advance the public good. If the leadership of countries with monetary sovereignty has the political will and adequate understanding of the operational realities of money and fiscal policies, full employment can be achieved.

Wray and Nersisyan (2021) argue that Japan’s experience demonstrates how a country with monetary sovereignty can sustain high government debt ratios and persistent fiscal deficits without facing a sovereign debt crisis. At the same time, they contend that Japanese policymakers have remained constrained by orthodox doctrines of debt sustainability, leading them to adopt counterproductive measures—such as raising the consumption tax during economic downturns—and to miss opportunities to redesign fiscal policy to meet the country’s structural economic and demographic challenges. In their view, Japan’s record reveals both the resilience afforded by monetary sovereignty and the limitations imposed by adherence to mainstream fiscal orthodoxy.

Tcherneva (2011) argues that Bernanke’s analytical framework itself affirms the effectiveness of—and indeed the necessity for—fiscal action during economic slumps, and that accommodative monetary policy alone is insufficient. Tcherneva (2011) persuasively contends that Bernanke’s (2007, 2009) call for deficit reduction stands in direct contradiction to the logic of his own position (Bernanke 2000, 2002). Building on this insight, Tcherneva and Tymoigne (2024) note that Bernanke (2002, 2020) implicitly recognizes that sovereign currency-issuing countries do not face a financial constraint. They adduce that once the operational realities of monetary sovereignty are properly understood, fiscal policy should be deployed deliberately to achieve full employment and price stability.

In contradiction to Krugman (1998a, 1998b) and Bernanke (2000, 2002), Kregel (2000) and Akram (2016a, 2016b) have argued that merely raising inflation expectations would not solve problems for Japan (or any other country) because: investment depends on expected profitability, not mechanically on nominal or real interest rates; protracted stagnation reflects weak effective demand, not insufficient inflation expectations; and firms, whether domestic or multinational, will not invest simply because inflation or inflation expectations edge up if they expect low sales and low future profits. When monetary accommodation proves to be ineffective, well-directed, carefully planned, debt-financed government expenditure and public investment can raise output and employment. Various direct measures, such as public-sector employment, would be prudent and suitable.

New Keynesian economists, such as Bernanke (2000, 2002), Eggertsson (2006, 2008, 2012), and Krugman (1998a, 1998b), are not in disagreement with post-Keynesians about the use of fiscal policy. Indeed, Bernanke (2000, 2002, 2020) endorses Milton Friedman's idea of helicopter drops of money, while simultaneously and paradoxically calling for fiscal prudence (Bernanke 2007, 2009). For Krugman (1998a, 1998b) and Eggertsson (2006, 2008, 2012), a credible commitment to monetary expansion takes priority over fiscal actions. However, none of the New Keynesians advocate the creation of large-scale employment programs to address deep slumps or reduce the vicissitudes of economic fluctuations. For Krugman, uncertainty is mainly about the path of inflation and deflation, whereas for Keynes and post-Keynesians, uncertainty is an ontological feature of capitalism.⁷ Keynes ([1936] 2007) was aware of the limits and perils of monetary expansions, noting:

⁷ Keynes's ([1936] 2007) offered the following incisive observations about uncertainty in economic life: "our existing knowledge does not provide a sufficient basis for a calculated mathematical expectation" (152); "apart from the instability due to speculation, there is the instability due to the characteristic of human nature that a large proportion of our positive activities depend on spontaneous optimism rather than on a mathematical expectation, whether moral or hedonistic or economic. Most, probably, of our decisions to do something positive, the full consequences of which will be drawn out over many days to come, can only be taken as a result of animal spirits—of a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities" (161); and "human decisions affecting the future, whether personal or political or economic, cannot depend on strict mathematical expectation, since the basis for making such calculations does not exist; and that it is our innate urge to activity which makes the wheels go round, our rational selves choosing between the alternatives as best we are able, calculating where we can, but often falling back for our motive on whim or sentiment or chance" (162–63).

[C]ircumstances can develop in which even a large increase in the quantity of money may exert a comparatively small influence on the rate of interest. For a large increase in the quantity of money may cause so much uncertainty about the future that liquidity-preferences due to the security motive may be strengthened; whilst opinion about the future of the rate of interest may be so unanimous that a small change in present rates may cause a mass movement into cash. It is interesting that the stability of the system and its sensitiveness to changes in the quantity of money should be so dependent on the existence of a variety of opinion about what is uncertain. (172)

[W]e are tempted to assert that money is the drink which stimulates the system to activity, we must remind ourselves that there may be several slips between the cup and the lip (173)

For whilst an increase in the quantity of money may be expected, *cet. par.*, to reduce the rate of interest, this will not happen if the liquidity preferences of the public are increasing more than the quantity of money; and whilst a decline in the rate of interest may be expected, *cet. par.*, to increase the volume of investment, this will not happen if the schedule of the marginal efficiency of capital is falling more rapidly than the rate of interest; and whilst an increase in the volume of investment may be expected, *cet. par.*, to increase employment, this may not happen if the propensity to consume is falling off. Finally, if employment increases, prices will rise in a degree partly governed by the shapes of

the physical supply functions, and partly by the liability of the wage-unit to rise in terms of money. And when output has increased and prices have risen, the effect of this on liquidity-preference will be to increase the quantity of money necessary to maintain a given rate of interest. (173)⁸

SECTION VI. A SCHUMPETERIAN APPROACH

While the Keynesian framework provides the floor for activity and employment to foster the evolution of capitalism without Hayekian “liquidation,”⁹ the Keynesian strategy outlined above should be supplemented with policies to foster “creative destruction,”¹⁰ that is, the replacement of old industries with new, as articulated by Schumpeter ([1943] 1976).

Breaking the inertia of a liquidity trap and slow growth through creative destruction is an important function of the state. Thus, the goal of economic policy should be to create virtuous cycles of creative destruction characterized by innovation, mobilization of idle capital, and mutually reinforcing growth dynamics. New product creation implies that innovation renders older technologies obsolete, forcing a wave of structural replacement demand that consumers and firms cannot defer. The state should promote policies that unlock idle capital so that the anticipated high returns of paradigm-shifting products incentivize corporations to reallocate idle

⁸ *cet. par.*, is the abbreviation for the Latin phrase *ceteris paribus* which means other things being equal.

⁹ Friedrich August von Hayek ([1935] 1967, [1933] 1975a, 1975b) espoused that economic slumps are a necessary process of correcting distortions created during a prior boom. Excessive credit expansion and artificially low interest rates lead firms and investors to undertake too many or the wrong kinds of investments (“malinvestment”). In the liquidation phase non-profitable firms fail, bad investments are written off, and resources are reallocated to more productive use. Mass layoffs and a deep and prolonged slump results in high unemployment rates. However, Hayek (1975b) and most Austrian economists oppose fiscal actions to reduce the unemployment rate due to their opposition to almost any state intervention. Hayek (1975b) holds state interventions and the central bank’s low interest rate policy as primarily responsible for the marked increase in unemployment during slumps.

¹⁰ “Capitalism [...] is by nature a form or method of economic change [...] The fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumers’ goods, the new methods of production or transportation, the new markets, the new forms of industrial organization that capitalist enterprise creates. [...] The opening of new markets, [...] the organizational development from the craft shop and factory [...] that incessantly revolutionizes the economic structure from within incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism.” (Schumpeter [1943] 1976, 82–3)

cash and deposits into R&D and capital expenditure. Mutual reinforcement will occur when the resulting demand surge rejuvenates the dynamism of capitalism, raising the natural rate of interest and effectively lifting the economy out of the liquidity trap from the supply-side up.

Structural reforms to foster higher productivity growth are vital for rejuvenating growth. R&D collaboration among the public sector, universities, and firms should be promoted and governments should foster innovations in the public sector, enable industrial transformation, and develop human capital and capabilities. Keynesian policies aimed at full employment can make creative destruction palatable, encourage firms to take risks, and ensure effective demand.

Unlocking productivity growth is crucial for advanced capitalist countries, whether they are experiencing a liquidity trap or not. Due to anticipated demographic transitions—namely the decline in the working-age population—in the United States and most other advanced countries, productivity growth will be essential to ensure higher real incomes and maintain living standards. Firms must be incentivized to invest in equipment, intellectual property, and technology to raise productivity, rather than merely hoard cash, and the public sector needs to invest in infrastructure and support basic research and skill formation for the workforce of the future.

SECTION VII. CONCLUSION AND OPEN QUESTIONS

Advanced capitalist economies can be mired in a liquidity trap of persistent low growth and low inflation/deflation despite extended periods of low long-term interest rates. Accommodative monetary policy (viz., low interest rates) is often not enough to free an economy because a liquidity trap is rooted in uncertainty, pessimism, fear of capital loss, and strong preference for cash. When investment depends on investors' expectations and entrepreneurs' decisions, but prolonged weakness in effective demand results in lower sales and lower profits, the resultant slowdown in investment and economic activity, low utilization of labor, and economic growth well below a country's potential are too much for monetary policy alone to overcome.

As argued here, a coordinated strategy for overcoming a liquidity trap consists of three key policies:

- (1) yield curve stabilization to reduce interest volatility,
- (2) expansionary fiscal actions and public employment programs to boost aggregate demand, and
- (3) structural policy reforms to drive innovation and long-term productivity growth.

There are many open questions regarding the appropriate scale, scope, and specification of the policy response, as well as the sequencing of policies for addressing a liquidity trap. Some of the unanswered questions are as follows:

- (1) What exactly will these policies target?
- (2) Is there a main policy?
- (3) Does the main policy need to change from time to time?
- (4) What are the tradeoffs?

These are important issues of political economy. Social well-being depends on the common good, material quality of life, economic growth, and ecological sustainability. Thus, full employment, real median income growth, and support for the most-vulnerable people and communities should be top priorities, while the formation of new businesses and new industries to lift aggregate demand and cope with the challenge of climate change is essential for the vitality of society, economic growth, and sustainability. These important issues will be explored in further research.

REFERENCES

- Akram, T. 2016a. “Japan’s Liquidity Trap.” Levy Institute Working Paper No. 862. Annandale-on-Hudson, NY: Levy Economics Institute of Bard College.
- . 2016b. “Japan’s Liquidity Trap.” *Real-World Economics Review* 76: 16–42.
- . 2014. “The Economics of Japan’s Stagnation.” *Business Economics* 49(3): 156–75.
- Akram, T., and H. Li. 2020a. “JGBs’ Chronically Low Nominal Yields: A VEC Approach.”
- . 2020b. “An Analysis of the Impact of the Bank of Japan’s Monetary Policy on Japanese Government Bonds’ Low Nominal Yields.” In Alexis Stenfors and Jan Toporowski, eds., (2020). *Unconventional Monetary Policy and Financial Stability: The Case of Japan*. London: Routledge.
- Bernanke, B.S. 2020. “The New Tools of Monetary Policy.” *American Economic Review* 110 (4): 943–83.
- . 2009. “Current Economic and Financial Conditions and the Federal Budget.” Testimony before the Committee on the Budget, U.S. House of Representatives, Washington, DC, June 3. Available at: <http://www.federalreserve.gov/newsevents/testimony/bernanke20090603a.htm>
- . 2007. “Long-Term Fiscal Challenges Facing the United States.” Testimony before the Committee on the Budget, U.S. Senate, Washington, DC, January 18. Available at: <http://www.federalreserve.gov/newsevents/testimony/bernanke20070118a.htm>
- . 2002. “Deflation: Making Sure ‘It’ Doesn’t Happen Here.” Remarks before the National Economists Club, Washington, DC, November 21. Available at: <http://www.federalreserve.gov/boarddocs/speeches/2002/20021121/default.htm>
- . 2000. “Japanese Monetary Policy: A Case of Self-induced Paralysis?” in R. Mikitani and A.S. Posen (ed.), *Japan’s Financial Crisis and Its Parallel to U.S. Experience*. Special Report No. 13. Washington, DC: Peterson Institute for International Economics.
- Caballero, R. J., E. Farhi, and P.-O. Gourinchas. 2021. “Global Imbalances and Policy Wars at the Zero Lower Bound.” *The Review of Economic Studies* 88(6): 2570–621.
- Churchill, W.S. 1941. Remarks in the House of Commons, London. May 13. Cited in G. O’Brien (ed.), *Bartlett’s Familiar Quotations*. Nineteenth edition. Little, Brown and Company.
- Eggertsson, G.B. 2012. “Was the New Deal Contractionary?” *American Economic Review* 102(1): 524–55.

- . 2008. “Great Expectations and the End of the Depression.” *American Economic Review* 98(4): 1476–516.
- . 2006. “The Deflation Bias and Committing to Being Irresponsible.” *Journal of Money, Credit and Banking* 38(2): 283–322.
- Eggertsson, G.B., and P. Krugman. 2012. “Debt, Deleveraging, and the Liquidity Trap: A Fisher-Minsky-Koo Approach.” *The Quarterly Journal of Economics* 127(3): 1469–513.
- Fisher, I. 1933. “The Debt-Deflation Theory of Great Depressions.” *Econometrica: Journal of the Econometric Society* 1(4): 337–57.
- . 1932. *Booms and Depressions: Some First Principles*. New York: Adelphi Company.
- Hayek, F. A. (1933) 1975a. *Monetary Theory and the Trade Cycle*. New York: Augustus M. Kelley Publishers.
- . 1975b. *Full Employment at Any Price*. Occasional Paper 4. London: Institute of Economic Affairs.
- . (1935) 1967. *Prices and Production*. 2nd ed. New York: Augustus M. Kelley, Publishers.
- Keynes, J.M. (1936) 2007. *General Theory of Employment, Interest, and Money*. New York: Macmillan.
- . 1932. “A Note on the Long-Term Rate of Interest in Relation to the Conversion Scheme.” *The Economic Journal* 42(167): 415–23. <https://doi.org/10.2307/2224024>
- . 1930. *A Treatise on Money*, Vol. 1 & 2. London: Macmillan & Company.
- Kregel, J. 2014. “Liquidity Preference and the Entry and Exit to ZIRP and QE.” Levy Institute Policy Note 2014/5. Annandale-on-Hudson, NY: Levy Economics Institute of Bard College.
- . 2011. “Was Keynes’s Monetary Policy *À Outrance* in the *Treatise*, a Forerunner of ZIRP and QE? Did He Change His Mind in the *General Theory*?” Levy Institute Policy Note 2011/4. Annandale-on-Hudson, NY: Levy Economics Institute of Bard College.
- . 2000. “Krugman on the Liquidity Trap: Why Inflation Won’t Bring Recovery in Japan.” Levy Institute Working Paper No. 298. Annandale-on-Hudson, NY: Levy Economics Institute of Bard College.
- . 1998. “Aspects of a Post Keynesian Theory of Finance.” *Journal of Post Keynesian Economics* 21(1): 111–33. <https://doi.org/10.1080/01603477.1998.11490182>

- Krugman, P. 1998a. “Japan’s Trap.” Blog post. Available at:
<http://web.mit.edu/krugman/www/japtrap.html> (accessed August 13, 2026)
- . 1998b. “It’s Baaack! Japan’s Slump and the Return of the Liquidity Trap.” *Brookings Paper on Economic Activity* 2: 137–87.
- Pigou, A. C. 1943. “The Classical Stationary State.” *The Economic Journal* 53(212): 343–51.
- Robinson, J. 1937. *Introduction to the Theory of Employment*. London: Macmillan.
- Schumpeter, J. (1943) 1976. *Capitalism, Socialism and Democracy*. Fifth edition with a new introduction. London: George Allen & Unwin.
- Tcherneva, P.R. 2011. “Bernanke’s Paradox: Can He Reconcile His Position on The Federal Budget with His Recent Charge to Prevent Deflation?” *Journal of Post Keynesian Economics* 33(3): 411–34.
- Tcherneva, P.R., and E. Tymoigne. 2024. “Seismic Shifts in Economic Theory and Policy: From the Bernanke Doctrine to Modern Money Theory.” *Journal of Post Keynesian Economics* 47(4): 853–74.
- Wray, L.R., and Y. Nersisyan. 2021. “Has Japan Been Following Modern Money Theory without Recognizing It? No! And Yes.” Levy Institute Working Paper No. 985. Annandale-on-Hudson, NY: Levy Economics Institute of Bard College.
- . 2020. “Does the National Debt Matter?” *The Japanese Political Economy* 46(4): 261–86.