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The Impact of the Bank of Japan's Monetary Policy on Japanese Government Bonds' Low Nominal Yields

by

Tanweer Akram
Thrivent

and

Huiqing Li
Central University of Finance and Economics

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Levy Economics Institute
P.O. Box 5000
Annandale-on-Hudson, NY 12504-5000
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ABSTRACT

Nominal yields for Japanese government bonds (JGBs) have been remarkably low for several decades. Japanese government debt ratios have continued to increase amid a protracted period of stagnant nominal GDP, low inflation, and deflationary pressures. Many analysts are puzzled by the phenomenon of JGBs' low nominal yields because Japanese government debt ratios are elevated. However, this paper shows that the Bank of Japan's (BoJ) highly accommodative monetary policy is primarily responsible for keeping JGB yields low for a protracted period. This is consistent with Keynes's view that the short-term interest rate is the key driver of the long-term interest rate. This paper also relates the BoJ's monetary policy and economic developments in Japan to the evolution of JGBs' long-term interest rates.

KEYWORDS: Japanese Government Bonds; Long-Term Interest Rates; Nominal Bond Yields; Monetary Policy; Bank of Japan; John Maynard Keynes

JEL CLASSIFICATIONS: E43; E50; E58; E60; G10; G12

1. INTRODUCTION

The nominal yields of long-term Japanese government bonds (JGB) have been exceptionally low for several decades. This persistence, particularly amid the elevated and rising ratios of government debt, is contrary to the conventional view, which is that higher debt ratios lead to higher government bond yields as investors become concerned about the sustainability of government debt and begin to worry about the increased prospect of debt default. However, the low nominal yields of JGBs are consistent with Keynes's view that the central bank's actions have a decisive influence on long-term government bond yields, as the Bank of Japan (BoJ) has kept its policy rates low and has undertaken accommodative monetary policy.

The conventional view has guided mainstream empirical analysis of the dynamics of JGB yields. Analysts acknowledge that JGB yields have stayed persistently low despite a high government debt ratio. Nevertheless, an examination of their arguments and conclusions shows that mainstream analysts firmly believe JGB yields will eventually rise sharply unless authorities can stabilize and reduce the government debt ratio, and that there is a realistic risk of debt default.

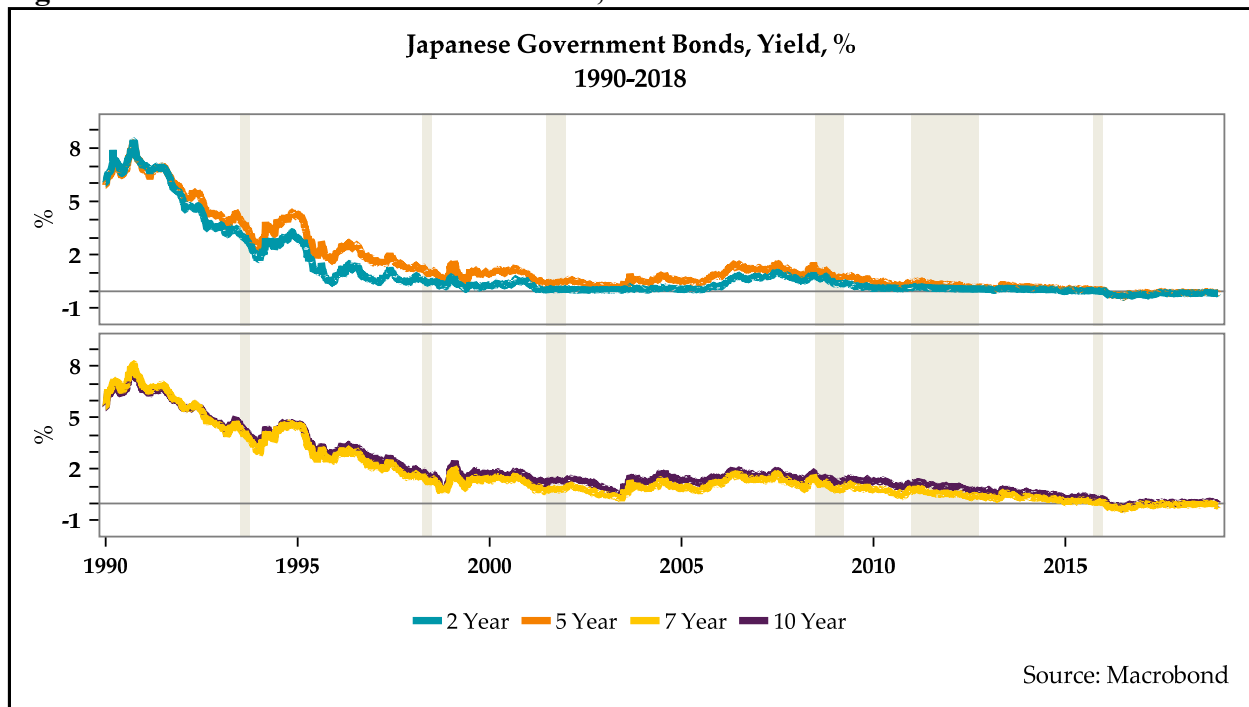
In contradistinction to the conventional view, this paper explains the persistence of low JGB yields from a Keynesian view, arguing that this provides the appropriate framework for understanding the dynamics of JGB yields. The approach taken here is descriptive and the perspective adopted is based on econometric evidence presented in studies carried out by Akram and Das (2014) and Akram and Li (2018), which show that the Keynesian framework is much more consistent with the JGBs' observed dynamics.

The paper is arranged as follows. Section 2 describes the evolution of JGBs' nominal yields and puts it in the context of key macroeconomic developments in the Japanese economy. Section 3 explains the conventional view of the drivers of long-term interest rates. Section 4 presents the Keynesian framework as an alternative to the conventional view. Section 5 examines the theoretical and policy implications of the findings. Section 6 concludes with a summary.

2. THE EVOLUTION OF JGB NOMINAL YIELDS AND THE JAPANESE ECONOMY

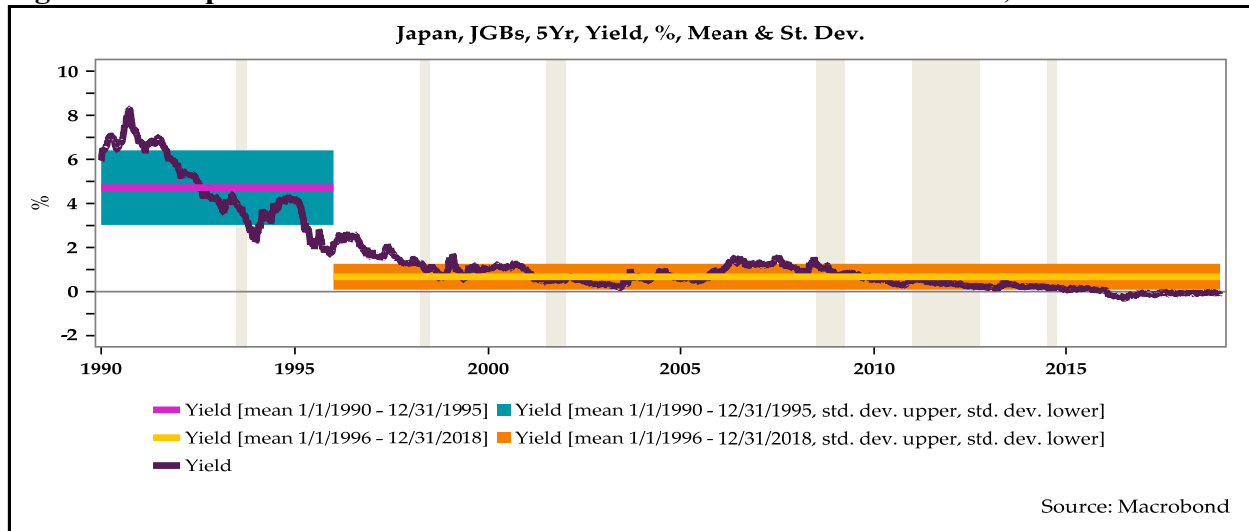
A review of the evolution of JGB nominal yields since 1990 reveals they fell sharply in the mid-1990s. The sharp decline occurred as asset bubbles in the Japanese equities and real estate markets came to an end (Akram 2014; Garside 2012). JGB yields have remained low since then (figure 1). The yields on JGBs turned very low at the beginning of the 21st century. They declined again in the aftermath of the recessions during the global financial crisis and after the Tohoku earthquake. They also declined in response to the launch of the BoJ's launch of their quantitative and qualitative monetary easing (QQME) program, which was followed by the adoption of negative interest rates and, subsequently, yield curve control. In fact, nominal yields on JGBs crossed into negative territory in early 2016 as the BoJ's policy shifted to QQME with yield curve control.

Figure 1: Evolution of JGB Nominal Yields, 1990–2018



Along with the decline in nominal JGB yields, the standard deviation of JGB yields has fallen noticeably since the mid-1990s (figure 2). This means that the day-to-day volatility of JGB yields has declined as well.

Figure 2: Compression of the Standard Deviation of JGB Nominal Yields, 1990–2018



Government debt ratios in Japan have been elevated (figure 3), rising sharply between 1990 and 2018, as measured by net and gross debt ratios. This increase occurred because the country had been running fiscal deficits consistently since the mid-1990s (figure 4). Fiscal deficits widened sharply in the late 1990s and stayed wide until 2005. For a few years before the global financial crisis, fiscal deficits did narrow, but with the onset of the financial crisis, they widened again. In recent years, fiscal deficits have again narrowed because of the moderate improvement in economic growth. The rise in government debt ratios is due to various factors, including slower economic growth, fiscal stimulus, increased transfers, and the aging of the population.

Figure 3: Evolution of Government Debt Ratios, 1990–2018

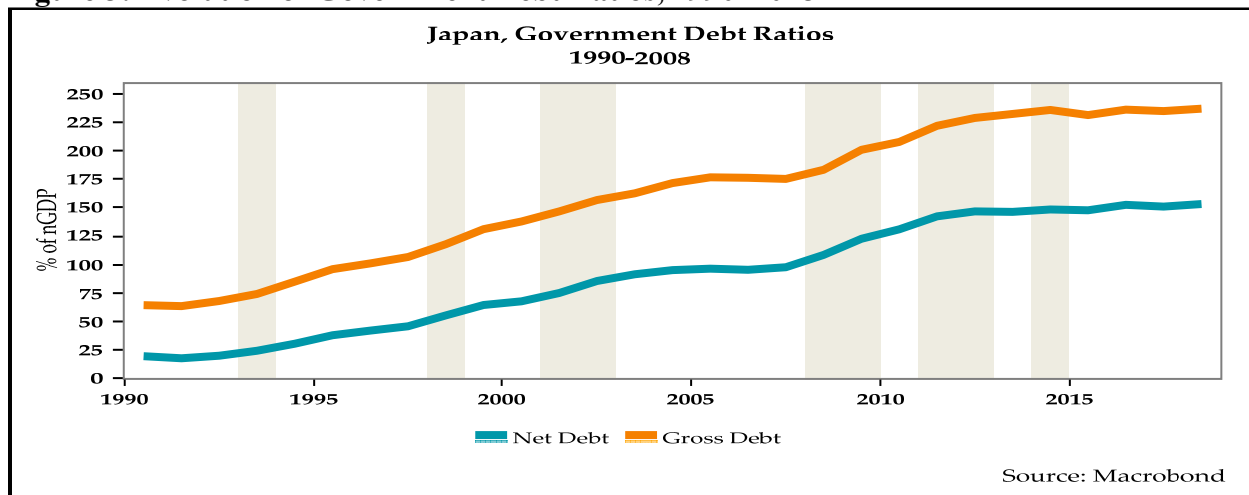
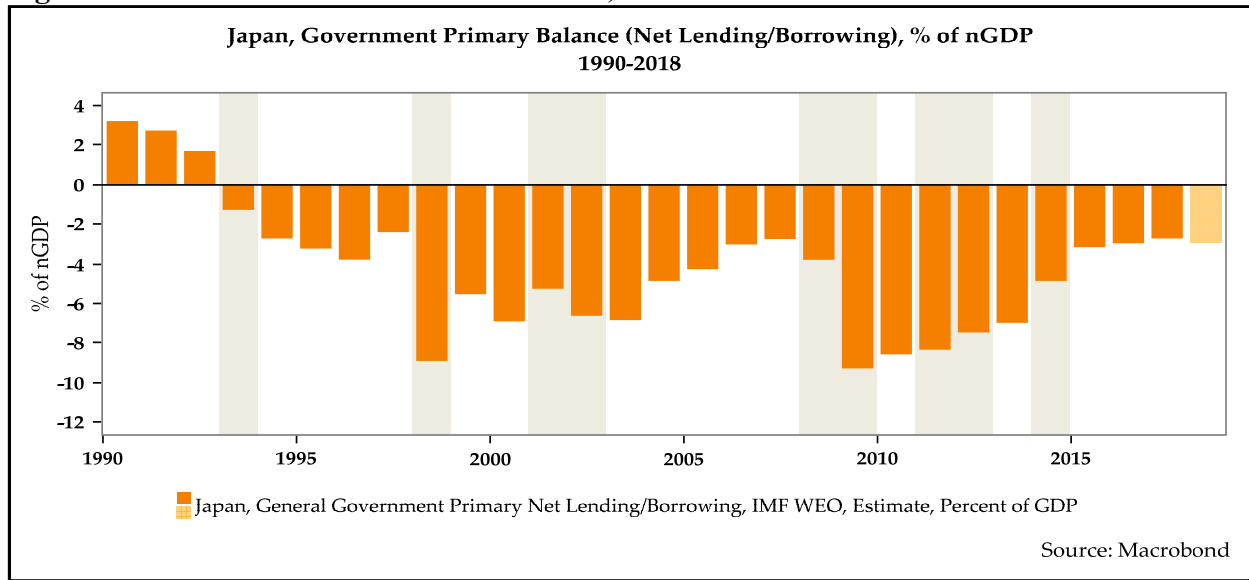


Figure 4: Evolution of Fiscal Balance Ratios, 1990–2018



The short-term interest rate in Japan has moved in lockstep with the policy rate (figures 5A and 5B). The BoJ began reducing its policy rate in mid-1991 and continued to cut the rate until later in 1995; the short-term interest rate followed suit. The BoJ kept its policy rate low and unchanged from late 1995 to early 2000. The short-term interest rate remained low and range-bound during this period as well.

Figure 5A: Coevolution of the Policy Rate and the Short-Term Interest Rate, 1990–1999

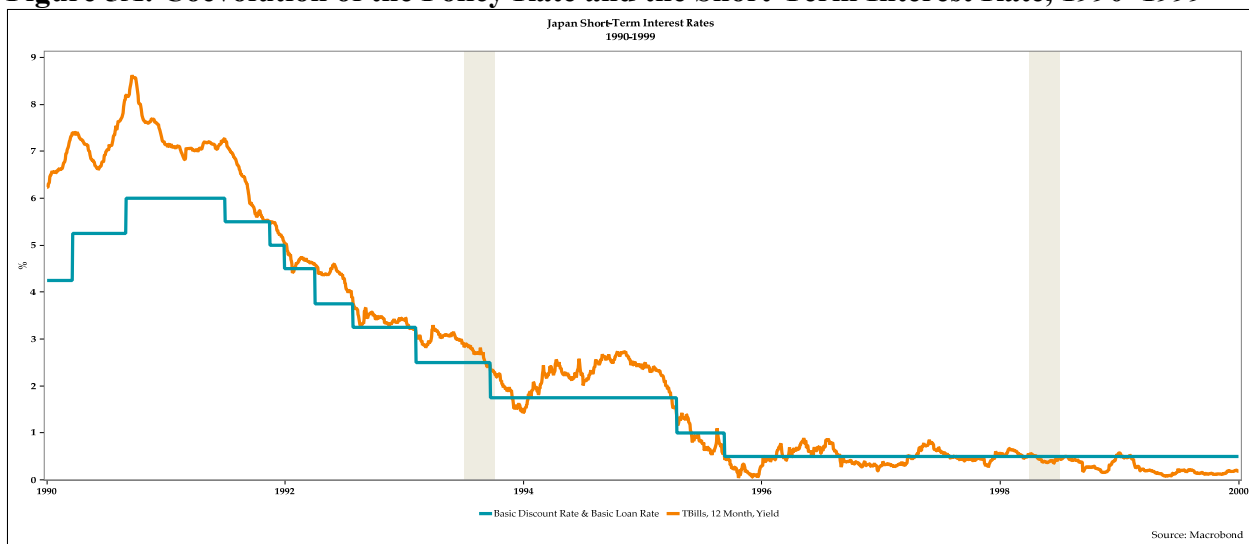
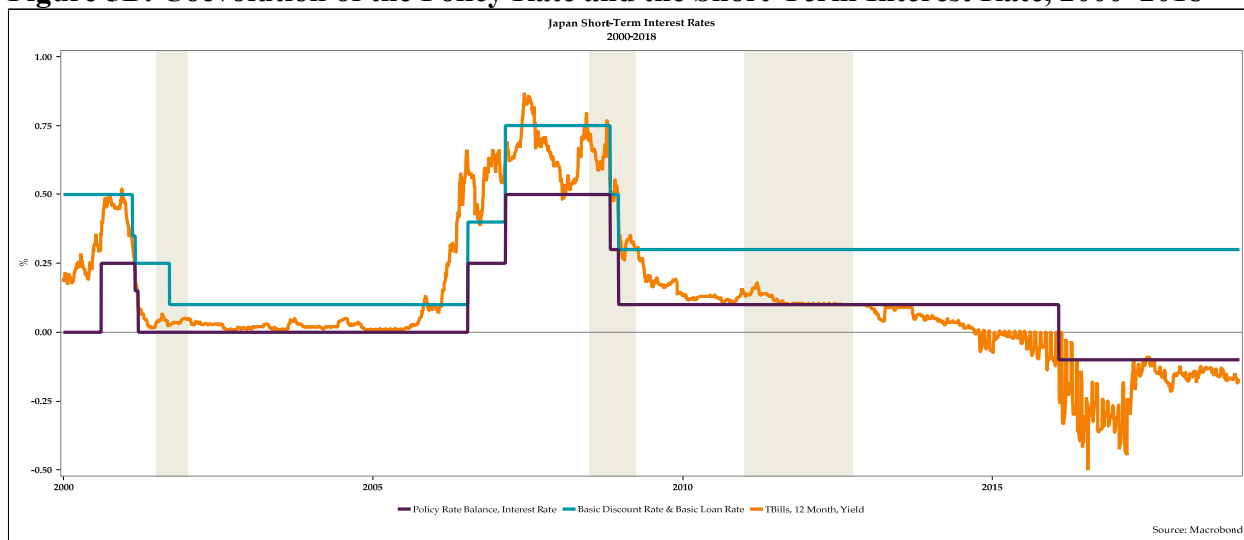


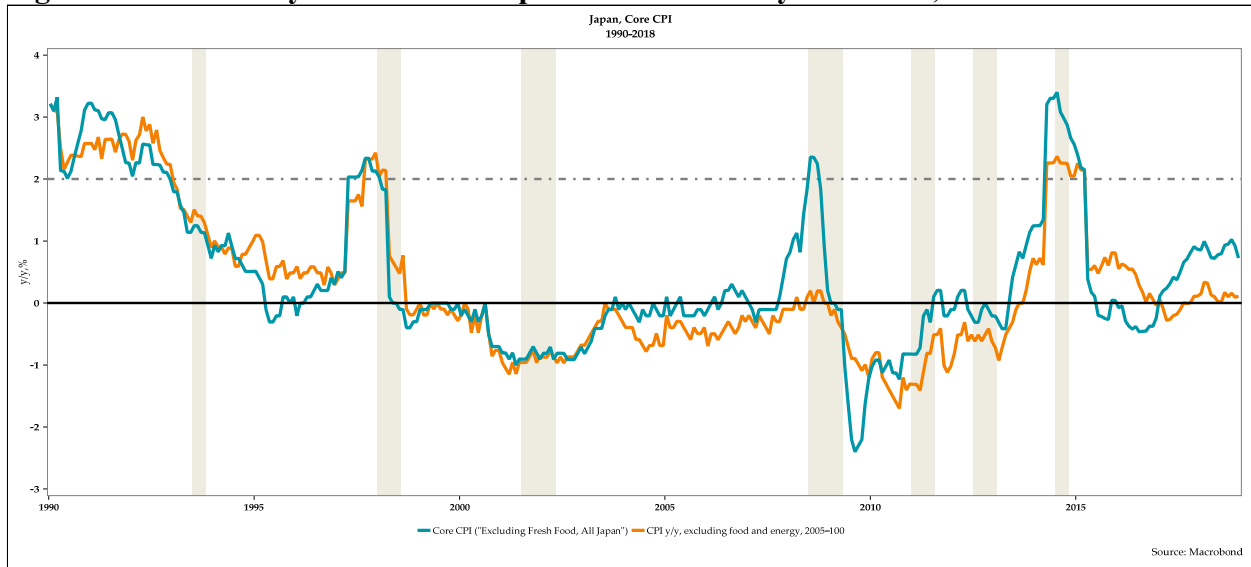
Figure 5B: Coevolution of the Policy Rate and the Short-Term Interest Rate, 2000–2018



The BoJ pursued a zero interest rate policy (ZIRP) from September 2001 until July 2006; the short-term interest rate was close to zero during this period. As the BoJ raised its policy rate slightly, the short-term interest rate increased modestly. The onset of the global financial crisis, however, caused the BoJ to reduce its policy rate. The short-term interest rate declined with the reduction of the policy rate. The BoJ again resorted to ZIRP between December 2008 and December 2015, with the short-term interest rate range-bound near zero. However, it began to decline after that in anticipation of accommodative monetary policy action. With the introduction of the negative interest rate policy in January 2016, the short-term interest rate fell further, and has been negative ever since.

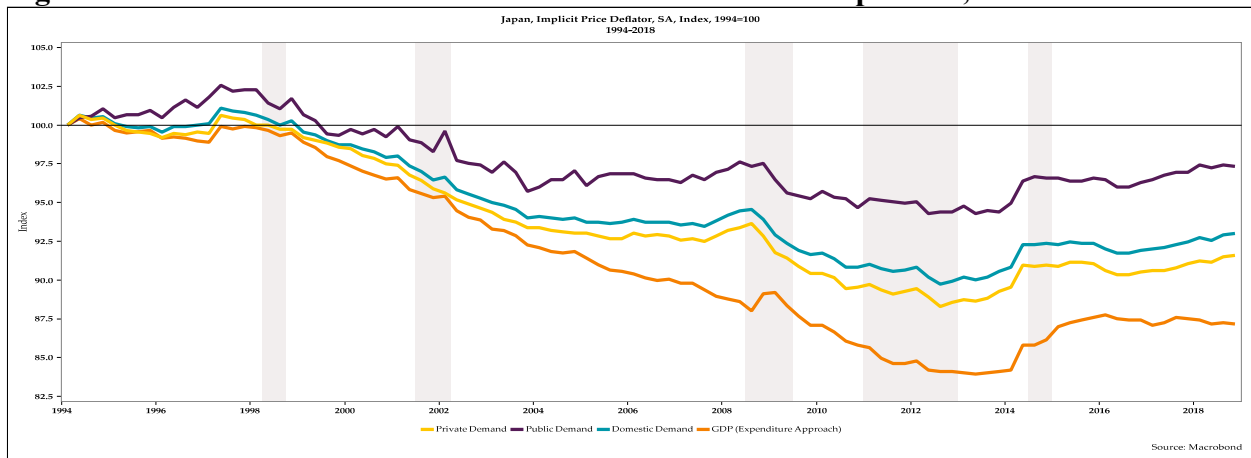
Japan's economy has been characterized by low inflation and deflationary dynamics since the mid-1990s (figure 6). Core inflation—as measured by the consumer price index (CPI) excluding fresh food and the CPI excluding food and energy—has been consistently low or in outright deflation with a few exceptions. Since the mid-1990s, the few episodes of increases in these core CPI inflation measures are due to either an increase in the sales tax rate in April 1997 from 3 percent to 5 percent and again in April 2014 from 5 percent to 8 percent, or an increase in energy prices from 2007 to 2008.

Figure 6: Inflationary Pressures in Japan as Measured by Core CPI, 1990–2018



The deflationary dynamics from which the Japanese economy has suffered are also well reflected in the deflators for real GDP and the various expenditure components of aggregate demand. The decline in these deflators (figure 7) shows the persistence of low inflation and deflationary pressures throughout the economy.

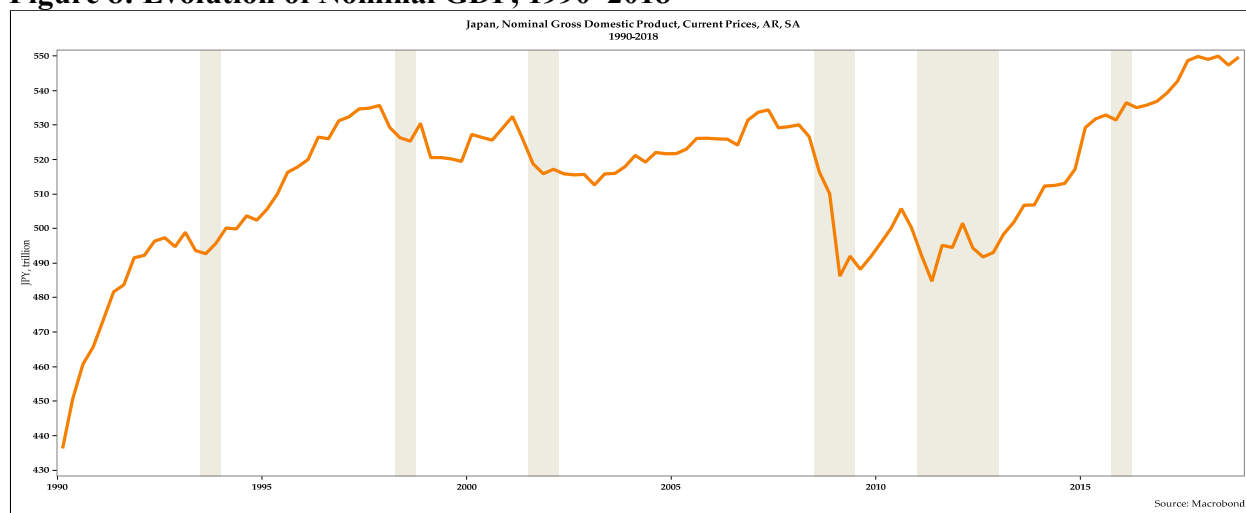
Figure 7: Evolution of Deflators for GDP and its Various Components, 1990–2018



The Japanese economy’s stagnation is evident in the evolution of its nominal GDP (nGDP) (figure 8). The nGDP was essentially flat from the late 1990s to the mid-2000s. It fell between 2007 and 2008 during the global financial crisis and remained flat for a few years afterward.

However, since the advent of Abenomics,¹ nGDP has gradually risen due to the combination of real GDP growth and moderate inflation, even though inflation is still well below the BoJ's target.

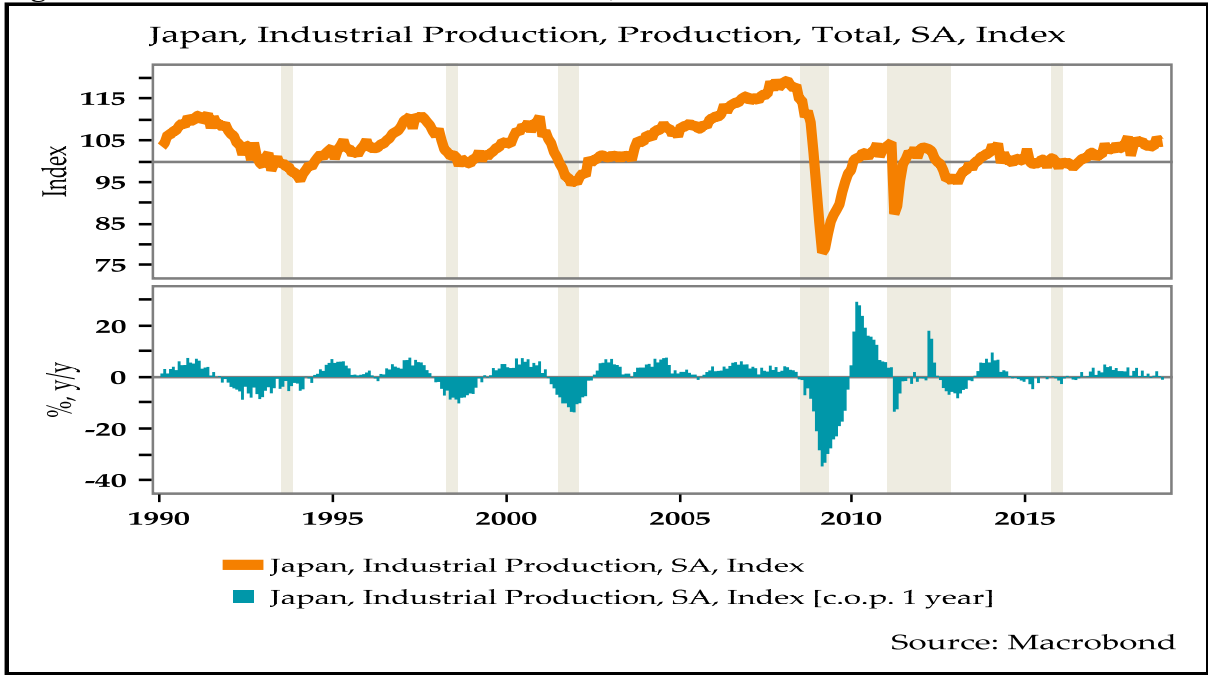
Figure 8: Evolution of Nominal GDP, 1990–2018



The level of and growth in Japan's industrial production provides a useful overview of the country's business cycle conditions (figure 9). Since the mid-1990s, the increase in industrial production in Japan has been fairly soft. Industrial production peaked in 2007, and then fell sharply during the global financial crisis. It again fell sharply during the recession caused by the Tohoku earthquake and tsunami. Since then, industrial production's growth has been tepid. While it has gradually risen since 2017, it has yet to surpass its 2007 peak.

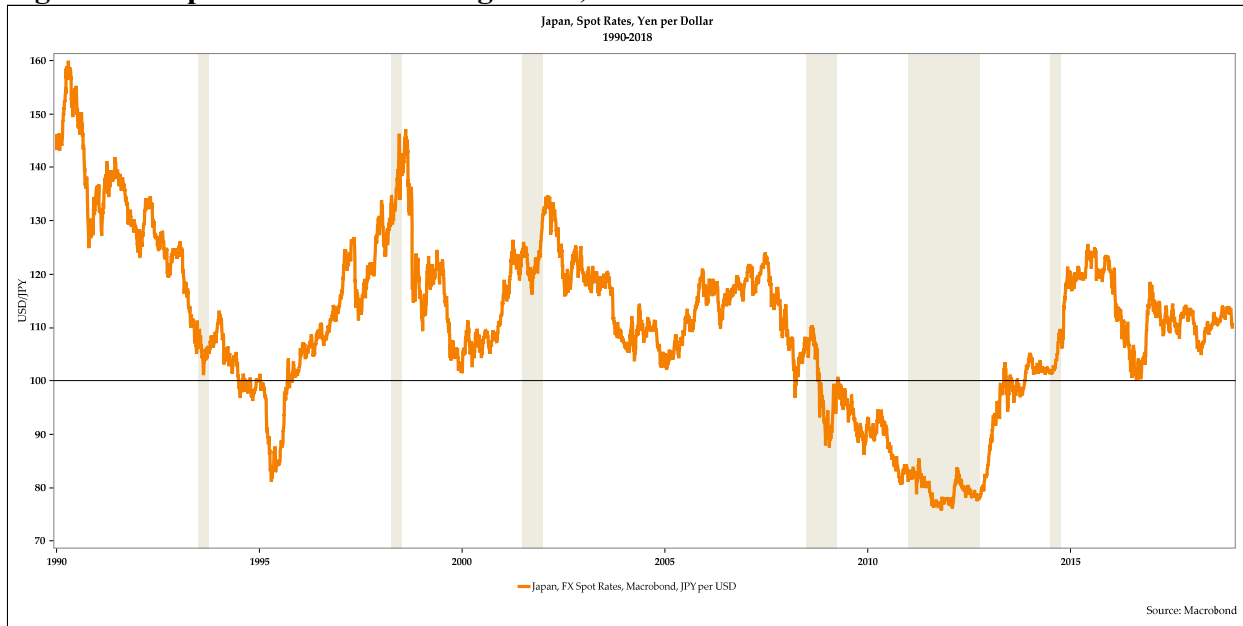
¹ Abenomics is the policy agenda introduced by the Japanese Prime Minister Shinzo Abe since assuming office in December 2012. It consists of three components: (1) accommodative monetary policy, (2) fiscal actions, and (3) structural reform policies. Abenomics' record has been mixed. For various perspectives and debates on Abenomics see Akram (2014, 2019), Hausman and Wieland (2014), Fukuda (2015), and Katz (2014).

Figure 9: Evolution of Industrial Production, 1990–2018



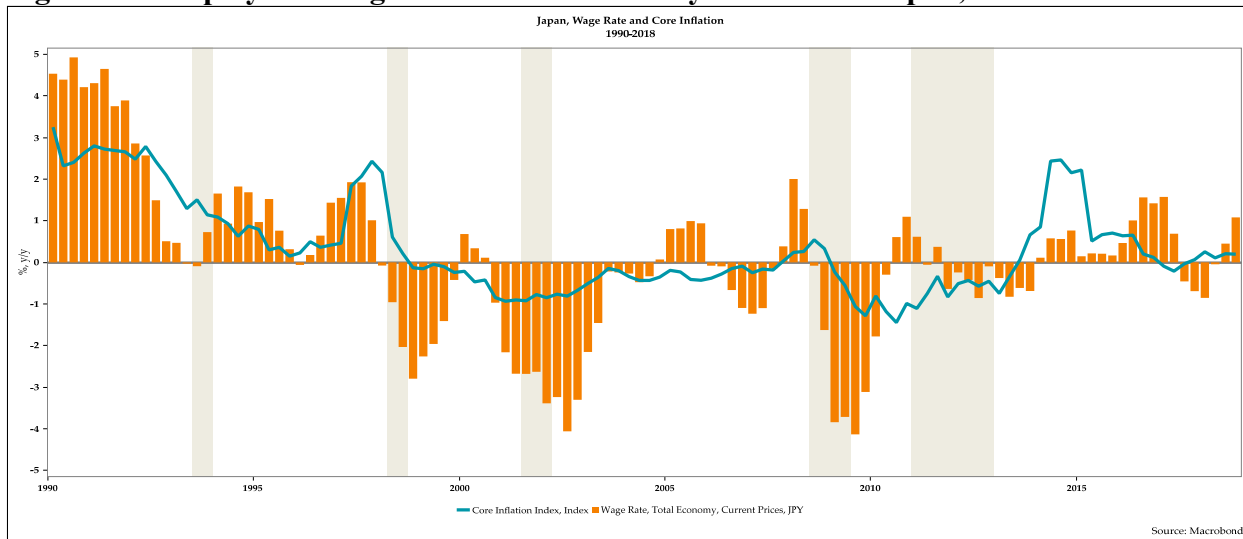
The Japanese yen’s exchange rate had substantial swings between 1990 and 2018 (figure 10). The yen appreciated strongly from the early to mid-1990s—from a peak of about ¥160/\$ to about ¥80/\$—but it depreciated to around ¥140/\$ by the late 1990s. Between late 1990 to early 2012, it generally appreciated. Its appreciation peaked at around ¥76/\$ in January 2012. The protracted appreciation of the Japanese yen hurt the country’s exports and reduced Japan’s export competitiveness. By late 2012, the yen’s appreciation reversed. From 2016 to the end of 2018, the yen has traded between ¥100/\$ to ¥110/\$.

Figure 10: Japanese Yen’s Exchange Rate, 1990–2018



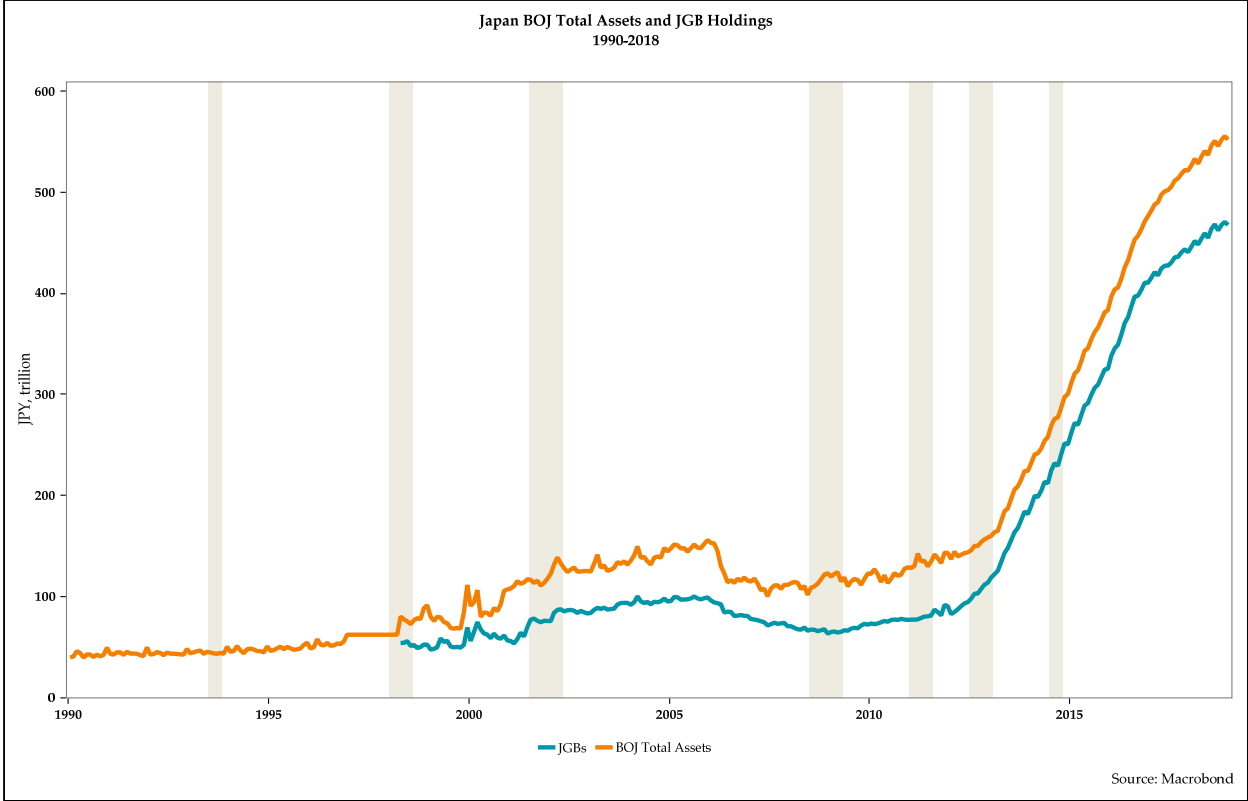
The weakness of wage growth has underscored the persistence of deflation and low inflation in Japan (figure 11). Wages, along with labor productivity and markups, are a key driver of prices. Thus, the weak wage growth has resulted in restrained inflation pressure and low inflation expectations. Indeed, for many years—since the late 1990s—the Japanese economy has been characterized by declining wages, resulting in deflation and low inflation for the country.

Figure 11: Employees’ Wage Rate and Inflationary Pressure in Japan, 1990–2018



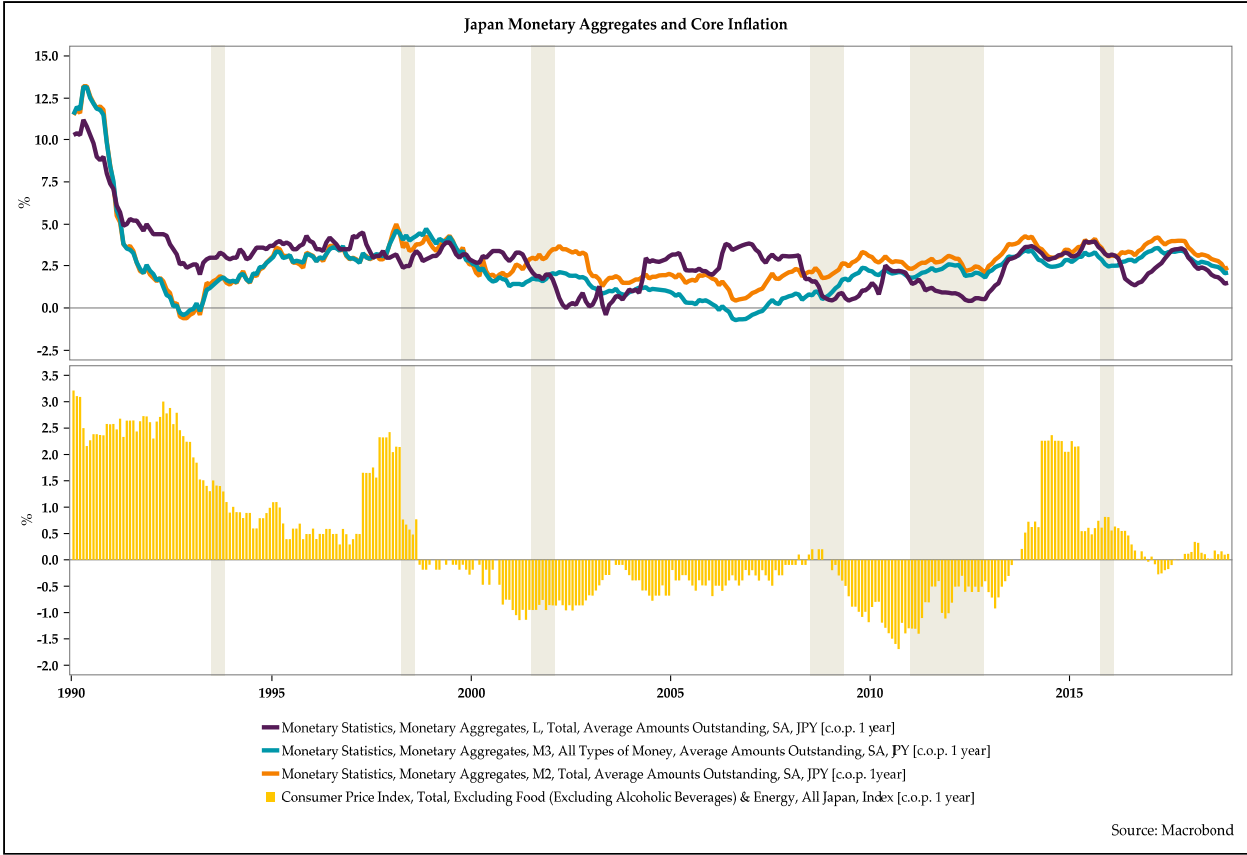
The BoJ’s balance sheet has evolved with its policy response (figure 12). In the late 1990s, the central bank’s balance sheet expanded modestly. This gradual expansion continued amid ZIRP until 2006, after which its balance sheet declined and then remained flat until the advent of Abenomics and QQME programs. With the launch of QQME, the BoJ’s balance sheet expanded stupendously from just ¥175 trillion in April 2013 to nearly ¥550 trillion as of December 2018. This tremendous expansion was mainly due to large-scale JGB purchases as well as purchases of other securities, including exchange-traded funds (ETFs) and Japanese real estate investment trusts (J-REITs).

Figure 12: The BoJ’s Balance Sheet, 1990–2018



Since the mid-1990s, various monetary aggregates in Japan—measured in terms of M2, M3, and L—have expanded, though less so than in the early 1990s (figure 13). Nevertheless, the Japanese economy has experienced either low inflation or outright deflation, as reflected in the evolution of the two measures of core CPI.

Figure 13: Monetary Aggregates and Core Inflation, 1990–2018



Japan’s macroeconomic conditions described here since the mid-1990s have fostered conditions that caused the BoJ to keep its policy rate low and undertake highly accommodative monetary policy. The BoJ’s accommodative monetary policy is responsible for the persistence of low long-term JGB yields. As will be shown in the sections that follow, this is exactly in accordance with Keynes’s view on the effect of a low policy rate and low short-term interest rate on the long-term interest rate of government bonds.

3. THE CONVENTIONAL VIEW

Conventional wisdom holds that elevated government debt ratios lead to higher government bond yields. This is based on the loanable funds theory of interest rates, which says that the interest rate is the price of funds and that the supply of loanable funds (or saving) is discouraged (encouraged) by low (high) interest rates. Increased government net borrowing leads to higher

demand for funds. Given a supply schedule, higher demand for funds raises the equilibrium interest rate.

Conventional wisdom is also in accordance with the standard IS-LM² model. In the IS-LM model, higher government borrowing shifts the IS curve to the right. When all other factors are held constant, it raises the equilibrium interest rate on government bonds. More sophisticated neoclassical models using the Ramsey model (1928) or the overlapping generations model (Samuelson 1958) with rational expectations also lead to similar results in which higher government spending and borrowing can crowd out private investment and lead to a higher equilibrium interest rate on government bonds. Similar results are obtained even in New Keynesian dynamic stochastic general equilibrium models with rigidities in nominal prices or wages (or other distortions), although these models often do provide some scope for activist fiscal policy, at least in the short term. Some New Keynesian models that retain nominal rigidities, asymmetric information, market imperfections, hysteresis, and coordination failures in the long run leave scope for activist policies. However, in most New Keynesian models, the classical results prevail in the long run because these New Keynesian models are based on the view that the economy eventually gravitates to full employment.

Reinhart and Rogoff (2009) embrace conventional wisdom concerning the effect of the higher fiscal deficit ratio and elevated government debt ratio on government bond yields. Their claim is that historical evidence supports the view that high fiscal deficits and elevated government debt ratios have led to higher interest rates on government bonds, increased probability of debt default and financial crisis, slowed economic growth, and so forth. Although their interpretation and analysis of the historical data has been questioned and disputed (Nersisyan and Wray 2010; Herndon, Ash, and Pollin 2014), it remains the conventional wisdom.

Most of the existing literature on JGBs, Japanese government debt sustainability, and related issues has been motivated by conventional wisdom. This is illustrated here with reference to the works of various mainstream analysts. These analysts have consistently proclaimed that: (1) JGB yields will eventually rise unless the authorities can stabilize and reduce the government debt

² “investment-savings” (IS) and “liquidity preference-money supply” (LM)

ratio; and (2) there is a realistic prospect of debt default in the foreseeable future. So far, such fears have proved to be unfounded. Indeed, portfolio managers betting on such views would have consistently lost money.

Tokuoka (2010) insists that the market's capacity to absorb JGBs is likely to diminish. As a result, he conjectures that JGB yields are destined to rise, particularly amid a rapidly aging population. He believes that fiscal consolidation is necessary to keep JGB yields low and retain stability in the financial markets. He acknowledges that despite elevated debt ratios, JGB yields have remained low, but he attributes this to the large pool of household savings, the presence of large and stable institutional investors, and a strong home bias (that is, domestic investors strongly prefer their own government bonds over those of foreign governments).

Lam and Tokuoka (2013) contend that elevated and rising debt ratios are bound to cause JGB yields to rise. They claim that JGB yields have stayed low and stable due to steady inflows from the household and corporate sectors, high domestic JGB ownership, and safe-haven flows in light of the European debt crisis.

Atasoy, Ertuğrul, and Ozun (2014) regard JGBs' low and stable yields as a puzzle. While they admit that the BoJ's actions have kept JGB yields low, they also attribute it to high domestic bond ownership of households, corporations, and pension and insurance funds.

Horioka, Nomoto, and Terada-Hagiwara (2014) claim that unless the Japanese authorities substantially reduce the government debt ratio, JGB nominal yields are likely to spike.

Doi, Hoshi, and Okimoto (2011) assert that Japanese government debt is not sustainable. They argue that unless the government-revenue-to-GDP ratio rises substantially, Japan faces a material risk of a sharp increase in JGB yields. They believe that eventually debt default could occur.

Hansen and İmrohoroğlu (2013) argue that without a substantial fiscal adjustment, Japan faces the challenge of fiscal sustainability. They believe that the expected decline in domestic saving

(especially household saving) caused by an aging population will make it necessary for Japan to reduce its government debt ratio. Otherwise, they claim, JGB yields would rise sharply.

In several papers, Hoshi and Ito (2012, 2013, 2014) have rehashed that Japan's fiscal situation is unsustainable. They argue that without a consumption tax hike beyond the 10 percent rate, a fiscal crisis is almost a certainty. They assert that low JGB yields are justifiable only if investors believe that a fiscal consolidation will occur. But if such expectation of fiscal consolidation changes, a fiscal crisis is inevitable even before government debt hits the private sector's demand ceiling for financial assets. The fear that bond yields will rise if government debt ratios increase is confined not just to analysts who have examined the Japanese case but is fairly widespread in the mainstream of the economics profession.

The findings of three important cross-country panel time-series data studies on government bonds yields and countries' fiscal positions illustrate the preponderance of this view:

- Baldacci and Kumar (2010) undertook a study of sovereign bond yields. They claim that higher deficit and government debt ratios lead to a significant increase in the long-term interest rate. Although they acknowledge that empirical findings are often unclear, their view is that large fiscal deficits and government debt ratios are likely to exert upward pressures on government bond yields in many advanced economies (such as Japan) over the medium term.
- Gruber and Kamin (2012) conclude that higher fiscal deficits and government debt ratios exert upward pressure on long-term government bond yields, based on their study of government fiscal positions and government bond yields in the OECD countries.
- Poghosyan (2014) suggests that in the long term, the government debt ratio's potential growth rate has a positive impact on government bond yields. However, his empirical findings reveal that the effect of an increase in the government debt ratio on government bond yields is fairly small.

What these analysts do not seem to realize is that for a country such as Japan—with its own currency, central bank, and the ability to tax and spend— interest rates on long-term government bonds are largely determined by the central bank’s actions on the policy rate and other instruments of monetary policy rather than other variables, not only in the short run but also in the long run. John Maynard Keynes’s perspective shows how this is possible.

4. THE KEYNESIAN FRAMEWORK

The Keynesian Framework to Understanding Bond Yields

In contrast to the conventional view, Keynes (1930) argues in his *Treatise on Money* that the short-term interest rate is the key driver of the long-term interest rate on government bonds. In the Keynesian framework, the central bank’s policy rate has a direct and decisive effect on the short-term interest rate on Treasury bills, which influences the long-term interest rate on government bonds.

In Keynes’s perspective, the influence of the short-term interest rate is much more than what would be expected under the conventional view based on rational expectations, perfect foresight, and full information. The conventional view is that the long-term interest rate depends not just on the current short-term interest rate, but also on expected short-term interest rates in the future and perhaps an appropriate term premium for different tenures of bonds. Under the conventional view, there is no reason to believe that the current short-term interest rate would have the decisive role in determining the long-term interest rate. Rather it would, at best, be just one factor among many others. The New Keynesian view is quite similar to the conventional view; it also implicitly assumes that investors have well-defined mathematical expectations about future short-term interest rates.

Keynes’s discussion of the relationship between the short-term interest rate and the long-term interest rate is found in Volume II of his *Treatise*. Kregel (2011) provides a detailed exposition of Keynes’s analysis. Keynes’s view differs markedly from the conventional view, including the New Keynesian view, of how investors form their expectations.

Keynes (1930, 352) starts with the observation that “[t]he main direct influence of the Banking System is over the short-term rate of interest.” He asks, “How can we be sure that the long-term rate of interest will respond to the wishes of a Currency Authority which will be exerting its direct influence, as it must, mainly on the short-term rate?” He further noted that “[f]or whilst it is reasonable that long-term rates should bear a definite relation to the prospective short-term rates, quarter by quarter over the years to come, the contribution of the current three-monthly period to this aggregate expectation should be insignificant in amount—so one might suppose.” Keynes (1930, 353) asserts: “[E]xperience shows that, as a rule, the influence of the short-term rate of interest on the long-term rate is much greater than anyone ... would have expected.”

Keynes (1930, 353–56) cites Riefler’s (1930) statistical work of on the relationship between the long- and short-term interest rates in the United States as evidence supporting his assertion. He also relies on some stylized facts about the relationship between the long-term interest rate and the short-term interest rate in the United Kingdom as additional empirical support of his contention.

Keynes offers several theoretical justifications for the short-term interest rate’s influence on the long-term interest rate.

First, he notes that:

if the running yield on bonds is greater than the rate payable on short-term loans, a profit is obtainable by borrowing short in order to carry long-term securities, so long as the latter do not actually fall in value during the currency of the loan. Thus, the pressure of transactions of this kind will initiate an upward trend, and this, for a time at least, will confirm the investor in a “bullish” feeling towards the bond market. Moreover, firms ... will tend to borrow on the security of these bonds when the cost of such borrowing is less than the running yield on the bonds; whilst they will sell the bond outright when the contrary is the case. (Keynes 1930, 357)

Second, Keynes argues (1930, 357–58) that it’s the need to generate income from holding financial assets that leads to a strong correlation between the short- and long-term interest rates. This stems from two factors: (1) institutional features of financial intermediaries, such as insurance companies, pensions, and trusts; and (2) the psychology of investors. He writes:

financial institutions ... vary from time to time the proportionate division of their assets between long-term and short-term securities respectively. Where short-term yields are high, the safety and liquidity of short-term securities appear extremely attractive. But when short-term yields are very low, not only does this attraction disappear, but another motive enters in, namely, a fear lest the institution may be unable to maintain its established level of income, any serious falling off in which would be injurious to its reputation. A point comes, therefore, when they hasten to move into long-dated securities; the movement itself sends up the price of the latter; and this movement seems to confirm the wisdom of those who were recommending the policy of the change-over. Thus ... this price will tend to rise a little, and the initial small price will tend to become a bigger one through its increasing the general anxiety amongst those who cannot afford to see their income from running yields suffer a serious fall, lest they miss the bus. (Keynes 1930, 357–58)

Third, Keynes (1930, 359–61) believes that investors are much more sensitive to near-term conditions because of ontological uncertainty (Davidson 2015) about the unknown future and that current conditions shape investors' outlook about the future. Keynes (1930, 359–61) argues that investors tend to be “over-sensitive ... to the near future, about which we may think we know a little,” though “even the best-informed ... know almost nothing about the more remote future.” Hence, the value of financial assets, including bonds, “will be found to be sensitive ... to short-period fluctuations in [their] known or anticipated profits,” compared to that “which a rational observer from an outside might consider.” He believes that “market valuation shows a strong bias towards the assumption that whatever conditions and results have been characteristics of the present and the recent past, and even more those which are expected to be characteristic of the near future, will be lasting and permanent.” According to Keynes, this occurs because “the ignorance of even the best-informed investor about the more remote future is much greater than his knowledge.” As a result, investors are “forced to seek a clue mainly here to trends further ahead.” He notes that “the vast majority” of investors are subject to “the prey of hopes and fears aroused by transient events.” He also notes that the value of a security is often determined “by the small fringe which is the subject of actual dealing,” who tend to hold securities for a short term. Such investors are very much “influenced by [the] cost of borrowing, and still more by their expectations on the basis of past experience of the trend of mob psychology.” Hence, “it will be to the advantage of the better informed professional to act in the same way—a short period ahead” rather than “take long views or to place even as much reliance as they reasonably

might on the dubieties of the long period;—the apparent certainties of the short period, however deceptive we may suspect them to be, are much more attractive.”

In essence, for Keynes (1930, 362) “there is no reason to doubt the ability of a Central Bank to make its short-term rate of interest effective in the market.”

In the *General Theory*, Keynes ([1936] 2007) extends and elaborates on his alternative theory of interest rates. He firmly rejected the loanable funds theory. For the purpose this paper, it is worth noting that he states: “The monetary authority often tends in practice to concentrate upon short-term debts and to leave the price of long-term debts to be influenced by belated and imperfect reactions from the price of short-term debts;—though here again there is no reason why they need do so. Where these qualifications operate, the directness of the relation between the rate of interest and the quantity of money is correspondingly modified” (Keynes [1936] 2007, 206). He shrewdly opines:

If the monetary authority were prepared to deal both ways on specified terms in debts of all maturities, and even more so if it were prepared to deal in debts of varying degrees of risk, the relationship between the complex of rates of interest and the quantity of money would be direct. The complex of rates of interest would simply be an expression of the terms on which the banking system is prepared to acquire or part with debts; and the quantity of money would be the amount which can find a home in the possession of individuals who—after taking account of all relevant circumstances—prefer the control of liquid cash to parting with it in exchange for a debt on the terms indicated by the market rate of interest. Perhaps a complex offer by the central bank to buy and sell at stated prices gilt-edged bonds of all maturities, in place of the single bank rate for short-term bills, is the most important practical improvement which can be made in the technique of monetary management. (Keynes [1936] 2007, 206)

Keynes’s view on the relationship between the short- and long-term interest rates is based on his analysis of investors’ expectations, the importance of business confidence, and the state of confidence. He underscores the precariousness of the basis of knowledge about economic and financial convention, the so-called “animal spirits” (Akerlof and Shiller 2009). Keynes ([1936] 2007, 161–63) states that “a large proportion of our positive activities depend on spontaneous optimism rather than on a mathematical expectation” and that “human decision affecting the future ... cannot depend strictly on mathematical expectation, since the basis for making such calculations does not exist.” Given this, investors are forced to take cues about their outlook

from current conditions. It is precisely because of these reasons that the short-term interest rate is the key driver of the long-term interest rate.

Modeling Government Bond Yields Based on an Interpretation of the Keynesian Framework

In recent years, several studies have used an interpretation of the Keynesian framework as the basis for modeling the dynamics of government bond yields. An intuitive explanation—rather than a mathematical version—of a model based on an interpretation of the Keynesian framework is provided here. Formal government bond yield models derived from an interpretation of the Keynesian framework are presented in Akram and Das (2014) and Akram and Li (2017). A simple two-period version of these models appears in Akram and Das (2019).

The long-term interest rate depends on the current short-term interest rate and an appropriate forward rate in standard models of long-term bond yields. What drives the forward rate? The Hicksian view is that the forward rate is driven solely by the pure (mathematical) expectation of future short-term interest rates (Hicks [1939] 2001, 141–70). The Kaleckian view is that the forward rate is driven not just by the pure expectations of future short-term interest rates but also a margin of safety (Kalecki [1954] 2010, 73–88).

Typically in most models in financial economics the forward rate is based on expected short-term interest rates in the future and the term premium, which is defined as some added compensation required to induce investors to hold long-term government bonds. If the central bank follows the Taylor rule, the expected future short-term interest rates and the term premium would mainly depend on the expected inflation and the expected growth rate (it will be assumed here that the central bank operates under a Taylor rule). Whereas in a world characterized by rational expectations, the expected rate of inflation and the expected growth rate would respectively amount to the mathematical expectations of the possible growth rates and the possible rates of inflation in various states of the world; in a world characterized by ontological uncertainty, the probability of unknown events is incalculable. Under a Keynesian perspective, investors are “over-sensitive ... [to] the near future ... because ... we know almost nothing about the more remote future” (Keynes 1930, 359). Hence, investors are forced to take cues about the

expected inflation and growth rates from current conditions. The current inflation rate provides the best guess for the expected inflation rate. Similarly, the current growth rate provides the best cue for the expected growth rate.

If the Keynesian framework is correct, the forward rate would depend on the current inflation and growth rates rather than the future inflation and growth rates. This implies that the long-term interest rate is based on the current short-term interest rate, current inflation, and the current growth rate. This also implies that the change in the long-term interest rate is based on the change in the short-term interest rate, the change in current inflation, and the change in the growth rate.

If the current government finance variable is thought to affect long-term interest rates—perhaps through influencing the forward rate—then this variable could be incorporated as well. The long-term interest rate would depend on the short-term interest rate, current inflation, the current growth rate, and the government finance variable. Similarly, the change in the long-term interest rate would depend on the changes in these variables. The short-term interest rate is the sum of the policy rate set by the central bank and a spread. Likewise, the change in the short-term interest rate is the sum of the change in the policy rate and the change in the same spread.

The empirical studies conducted by Akram and Das (2014, 2015, 2107, 2019) and Akram and Li (2016, 2017, 2018, forthcoming), find that the short-term interest rate is the most important driver of the long-term interest rate on government bonds in Japan, the eurozone, India, and the United States, after controlling for a wide range of macroeconomic variables, such as core inflation, industrial production, and fiscal variables (fiscal balance or fiscal debt ratios). Indeed, these studies find that the short-term interest rate is the key driver of the long-term interest rate. Moreover, changes in the short-term interest rate explain most of the changes in the long-term interest rate after controlling for other factors. Quite often the effects of fiscal variables on government bond yields are quite small and sometimes even opposite of what is expected under the conventional view. The Keynesian framework provides a simple but compelling explanation of the dynamics of government bond yields.

Akram and Das (2014) examine the relationship between the long-term interest rate on JGBs and the short-term interest rates, as well as other factors (such as inflation and economic growth) from 1994 to the end of 2012. They deploy the two-step feasible and efficient generalized method of moments (GMM) technique, and rely on the second- and third-period lags of the independent variables as instrument variables. They apply the Hansen (1982) J test of the overidentifying restrictions to check the validity and relevance of the instruments. They find that the BoJ has the ability to keep JGB nominal yields low by ensuring that the short-term interest rate is low.

Akram and Li (2018) also rely on a Keynesian perspective to explain why JGB nominal yields have been low for more than two decades. In examining the period from 1990 to 2017, they deployed several vector error correction (VEC) models to estimate long-term government bond yields. They show that the low short-term interest rate as influenced by the BoJ's accommodative monetary policy is mainly responsible for keeping long-term JGBs' nominal yields exceptionally low for a protracted period. Gregory and Hansen's (1996) cointegration test is used for detecting structural breaks. After incorporating structural breaks, they find that there is a positive relationship between the short-term interest rate and the long-term interest rate. However, there is a negative relationship between the net government debt ratio and the long-term interest rate. This means that higher government debt and deficit ratios do not exert upward pressure on JGBs' nominal yields.

These empirical studies show that the Keynesian framework can readily explain the dynamics of JGBs in terms of fundamental macro and financial variables.

5. POLICY IMPLICATIONS

The findings that are based on a Keynesian framework, as shown by Akram and Das (2014) and Akram and Li (2018), are relevant for ongoing policy debates about government bond yields, fiscal sustainability, fiscal policy, monetary policy, and financial stability in Japan and other advanced countries.

The BoJ has a decisive effect on JGBs' nominal yields through the monetary policy rate that determines short-term interest rates. A lower (higher) short-term interest rate is associated with a lower (higher) long-term interest rate. Hence, by keeping the short-term interest rate low (high) by setting the policy rate low (high), the BoJ keeps the long-term interest rate on JGBs low (high). Furthermore, the BoJ directly influences the long-term interest rate on JGBs and other financial assets through a range of actions, including: (1) its purchase of long-duration government bonds and other financial assets from dealers and financial institutions; (2) yield curve control; and (3) policy pronouncements.

The BoJ can effectively control JGBs' nominal yields and the shape of the yield curve in spite of elevated ratios of government debt and government primary/fiscal deficits. Contrary to conventional wisdom, elevated government debt and chronic government deficit ratios have not led to higher government bond yields. Furthermore, the BoJ's policy of low interest rates and the expansion of its balance sheet do not appear to be inherently inflationary.

The BoJ's low, near-zero, and negative interest policies and monetary accommodation in forms of quantitative and qualitative easing, yield curve control, and other innovations may well be warranted. Keynes (1930, 370) argues that amid economic stagnation "bolder measures are sometimes advisable" regarding monetary policy actions, noting that contrary to widely held beliefs, unconventional monetary policy—such as purchasing long-dated gilt-edged securities—is "quite free from serious dangers." The BoJ's actions have not led to financial instability or the debauching of the currency, as many have feared, but it is also correct to say that the BoJ has been unable to attain its 2 percent inflation target on a sustained basis. Indeed, the sustained 2 percent target inflation appears to be elusive.

Japan's experience suggests that there is no reason to doubt their government's ability to service its debt. Lerner (1943, 1947) holds that a government with monetary sovereignty is not constrained by the principles of "sound finance" that apply to households, businesses, and local/state governments. A sovereign government that issues debt payable in its own liabilities is fundamentally different from agents that issue debt that is *not* repayable in their own liabilities, as Wray ([1998] 2003, 2012), Fullwiler (2016), and others have pointed out. Japan's considerable experience in keeping the long-term interest rate on JGBs low over a protracted period despite elevated government debt ratios supports Sims' (2013) conjectures about government debt in a fiat monetary regime, as reflected in his propositions:

- "[N]ominal sovereign debt promises only future payments of government paper, which is always available."
- "[A] central bank can 'print money.' ... It will not be subject to the usual sort of run ... Its liabilities are denominated in government paper, which it can produce at will."

Detailed understanding of fiscal and monetary operations, as analyzed in Bindseil (2004), Fullwiler (2016, [2008] 2017), and Lavoie (2014), reveal that a variety of conventional wisdom concerning money, monetary operations, government debt, and debt sustainability is often erroneous. The conventional view regarding the consequences of expansionary fiscal policy and low interest rates in response to economic stagnation and low inflation has failed to materialize in Japan. Low JGB yields can be adequately explained within a Keynesian framework.

Going forward, the debate's focus should shift to the effectiveness, the efficiency, and the appropriateness of fiscal and monetary policies, as well as the goals of fiscal policy, rather than the perils of an expansionary and activist fiscal and monetary policy stance. This is not to claim that fiscal deficit ratios, government debt ratios, or the size of the central bank's balance sheet do not matter. These variables do matter. Indeed, experience suggests that they matter quite substantially. Under certain circumstances, expansionary monetary and fiscal policy can have extremely harmful consequences, including high inflation, hyperinflation, substantial exchange rate depreciation, loss of business and consumer confidence, distortion of incentives, deterioration of the standard of living, and effects on the distribution of income and wealth.

Japan faces many economic and social challenges (Akram 2019), such as slow economic growth, tepid labor productivity growth, a declining population, modest real income growth, demographic changes, a lack of openness to immigration, and so forth. Addressing these and other issues of growth, stability, and environmental sustainability should be the priority for policymakers rather than worrying about the risk of government debt default.

6. CONCLUSION

In Japan, the low short-term interest rate—induced by the BoJ—has been largely responsible for keeping long-term nominal yields on JGBs subdued despite chronically large primary/fiscal deficits ratios and elevated government debt ratios. Moreover, since early 2016, the BoJ has directly targeted the 10-year interest rate on JGBs. Given the influence of the policy rate on the short-term interest rate, the effect of the short-term interest rate on the long-term interest rate, the direct targeting of the long-term interest rate, the regime of yield curve control, and other measures undertaken by the BoJ, it can be asserted that the BoJ's actions are the primary driver of the long-term interest rate on JGBs. The BoJ should be able to keep JGBs' nominal yields low as necessary in the foreseeable future through a combination of a low policy rate, direct targeting of the long-term interest rate, and other accommodative monetary policy actions. Despite the elevated government debt ratio, the probability of default on government debt for Japan is extremely remote because the BoJ has the operational ability to always service its debt. The fear that JGB yields will dramatically spike even if the BoJ keeps its policy rate low, targets the long-term interest rate, and pursues an accommodative monetary policy is misplaced. It is contrary to a Keynesian understanding of the dynamics of government bond yields in a country with a sovereign currency.

Japan faces challenges for the 21st century. The Japanese authorities should focus on issues that are critical to the country's ongoing demographic transformation, economic prospects, and peace and security. The Japanese authorities will have to invest in human capital and capabilities, as well as in the nation's infrastructure. Policies need to foster economic and social institutions that

can enable Japan to prosper peacefully and securely so that it can contribute meaningfully to national and global well-being and the enrichment of human civilization. The point of fiscal and monetary policies in Japan will be to achieve worthwhile ends, such as high economic growth at close to full employment, sustained inflation around its target rate, financial stability, and shared prosperity.

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