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The Bank of Japan: Policy Framework, Challenges, and Conclusions

The Bank of Japan serves as the central bank for Japan that decides monetary policy actions for maintaining a stable economy. The Bank, like the Federal Reserve and many other central banks has a dual mandate, which states that, "The Bank of Japan conducts currency and monetary control, aiming at achieving price stability, thereby contributing to the sound development of the national economy" (Bank of Japan Act, Article 2). However, unlike the Federal Reserve, the Bank does not have an explicit indicator of "sound development of the national economy", like the Fed's 4.4% unemployment rate target. Section 1 will detail the Bank's monetary policy framework and the various tools it has tried to meet its goals. Section 2 will discuss various economic problems the Bank faces. Section 3 will conclude whether or not the Bank made the right decisions in trying to address these issues.

1 Monetary Policy Framework

To meet this mandate, the Bank set a target inflation rate of 2% growth of year over year CPI less fresh food growth rate, since 2% inflation is low enough to maintain stable prices, but still allows for sustained economic growth ("The "Price Stability Target" under the Framework for the Conduct of Monetary Policy"). To achieve this, the Bank first tried implementing Quantitative and Qualitative Easing (QQE) in April 2013 ("Introduction of the "Quantitative and Qualitative Monetary Easing""). Here, the quantitative aspect refers to expanding the monetary base via money market operations and the qualitative aspect refers to large purchases of bonds and private assets to help reduce risk ("Introduction of the "Quantitative and Qualitative Monetary Easing""). To further bolster this plan, the Bank began implementing negative interest rates in January 2016, in hopes that this would encourage investments and spending ("Introduction of

”Quantitative and Qualitative Monetary Easing with a Negative Interest Rate””). As Figure 1 indicates, the interest rate was reduced to -0.1% and has not moved since.

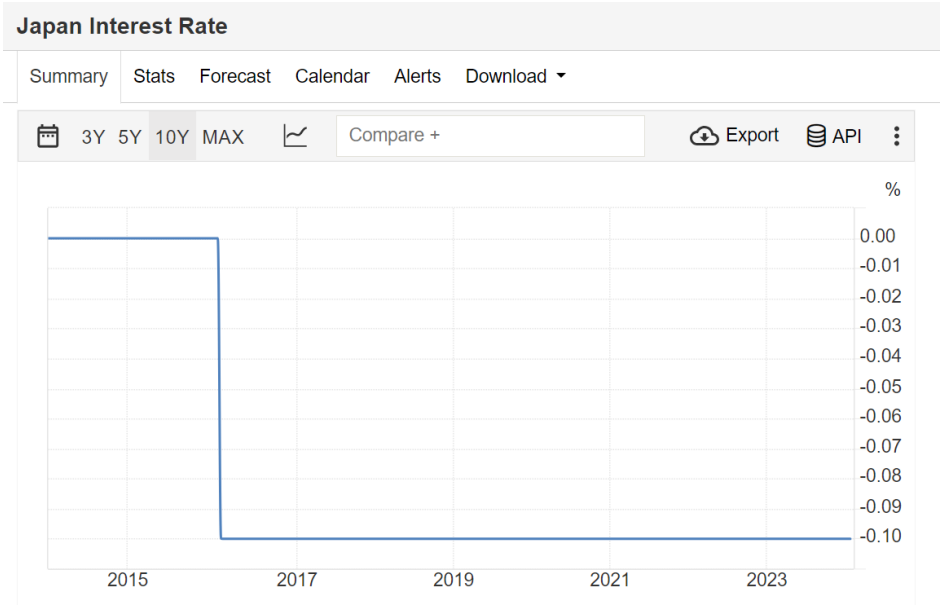

Figure 1: Japan Policy (Interest) Rate. Retrieved from Trading Economics, https://tradingeconomics.com/japan/interest-rate.

When negative interest rates and QQE failed to boost the economy, the Bank modified its monetary policy framework, introducing Quantitative and Qualitative Easing with Yield Curve Control. This new framework comprises two main components: Yield Curve Control (YCC) and an inflation-overshooting commitment (“New Framework for Strengthening Monetary Easing: ”Quantitative and Qualitative Monetary Easing with Yield Curve Control”“).

The first component, Yield Curve Control, was first introduced in 2016 shortly after negative interest rates were first introduced (“New Framework for Strengthening Monetary Easing: ”Quantitative and Qualitative Monetary Easing with Yield Curve Control”“). The idea is that in addition to having control over short-term interest rates, with YCC the Bank would also have indirect control over the long-term interest rates. They could ideally do this by buying bonds, which would increase the demand for the bonds and their prices, compressing the yield. In turn, this would disincentive others from buying bonds and instead encourage them to spend and

invest, stimulating economic growth.

Figure 2 shows the interest rate on 10 year bonds since 2015, with red lines indicating when the Bank increased the yield cap on these bonds. Note that in some instances, the long-term interest rate increased following an increase in the yield cap, but decreased in others. Because the yield cap was always raised, but the reaction differed substantially in each case, it is likely that other information, such as the Bank's attitude towards inflation and outlook of the economy played a role. As to whether or not YCC is effective for the Japanese economy will be further discussed in Section 3.

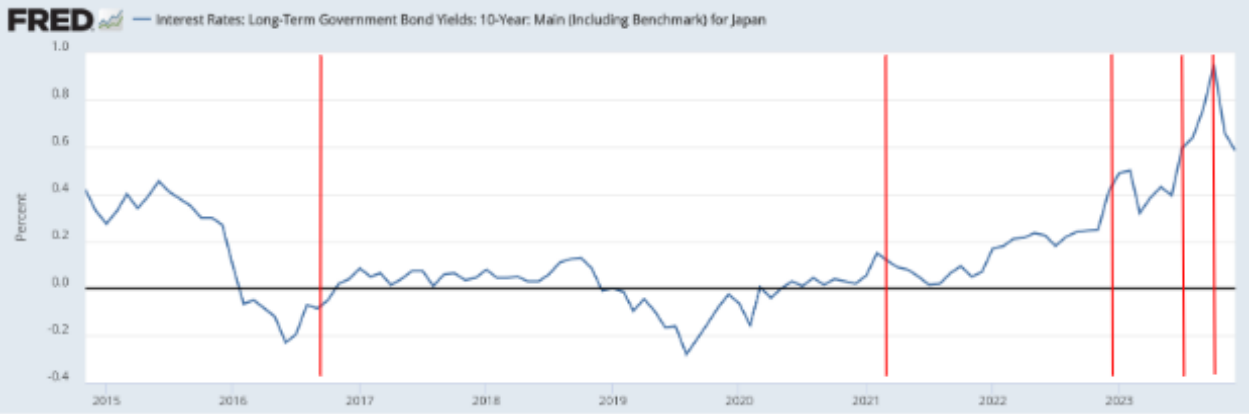

Figure 2: Interest rate on 10-year Japanese government bonds with indicators of when the yield cap was increased. Retrieved from FRED, Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org/series/IRLTLT01JPM156N.

The second, more unusual component is the Bank's "inflation-overshooting commitment", where the Bank promises to raise inflation to a rate higher than the target inflation rate for a sustained period before proceeding with monetary tightening ("New Framework for Strengthening Monetary Easing: "Quantitative and Qualitative Monetary Easing with Yield Curve Control""). While some argued that Japan would benefit from raising the target inflation rate to a higher number, the Bank worries that arbitrarily changing its targets would negatively impact its credibility and defeat the purpose of setting these targets and mandates in the first place (Kuroda). The Bank chose to include this to help combat Japan's adaptive inflation expectations and anchor

expectations to 2% since adaptive expectations means that long-term inflation expectations won't reach 2% until well after inflation rises to the target rate. Because this commitment implies rather reactionary policy regarding inflation, the Bank uses current CPI data to determine if changes should be made to monetary policy, rather than using forecasts to determine the next step. This policy would also help improve the Bank's credibility since it would help convince the world that this central bank is capable of ending Japan's long period of deflation and stagnation.

A third monetary policy tool that the Bank sometimes uses, but is not part of their official monetary policy framework is forward guidance. The Bank began using forward guidance in July 2018, where they said that, "the Bank intends to maintain the current extremely low levels of short- and long-term interest rates for an extended period of time" ("Strengthening the Framework for Continuous Powerful Monetary Easing"). This use of Delphic forward guidance allows the Bank to signal its intentions to the country and the markets without having to make concrete commitments that may become problematic in the future. By mentioning that interest rates will remain low for the foreseeable future, the Bank is able to communicate the fact that they intend on being dovish and will allow inflation to rise before raising interest rates. Doing so may stimulate more economic activity, as keeping a low interest rate with rising inflation compresses the nominal interest rate and reduces the yield on bonds.

2 Central Bank Challenges

Ever since the price bubble burst in the early 1990s, Japan's economy stagnated at a certain level without variation. This period is also known as the "Lost Decade" and was characterized by low economic growth, deflation, and financial crises ("Japanese Asset Bubble Burst of 1992"). Starting in 2016, the Bank of Japan has adopted an unconventional monetary tool to stimulate its economy, which has been haunted by persistent deflation, and demographic challenges, such as the aging population that led to a shrinking workforce and heavier burden on Japanese government finance. Through setting interest rates below zero and Yield Curve Control, the Bank of Japan aimed at reducing banks' hoarding money and encouraging more lending, spending, and investment across the economy.

People normally worry about inflation in their economy, nonetheless, deflation is a more severe problem than inflation. The phenomenon of deflation, represented by the persistent decline of prices on goods and services, has long affected the Japanese economy. In contrast with inflation, which can stimulate spending, since people expect the prices in the future will get higher; deflation has a cool down influence on the economy, because people expect prices will reduce in the future, so they would hoard money. As this cycle continues, domestic businesses' profits will decrease and the economy may fall into depression. Japan has a long history with deflation, extending back to the asset price bubble burst. The result saw property and stock market prices collapse, leaving banks in a prolonged period of non-performing loans and led to a prolonged period of economic stagnation. In order to reinvigorate Japan's economy, the Bank of Japan initially applied conventional monetary tools, such as lowering its interest rate to approximately zero. However, the conventional monetary policy did not work well in Japan, and the continuation of economic stagnation prompted the Bank of Japan to seek for more radical ways. The decision to adopt the negative interest rate policy had clear logic, which was to make it more costly for banks to keep their money unused than lending out or investing those money in projects. Theoretically, more lending, spending, and investment will help the economy to counter the deflationary pressure, making the inflation rate gradually approach the Bank of Japan's target, and eventually jump out of the deflation cycle.

The drive behind the implementation of negative interest rates policy was not only the deflation issue, the aging population in Japanese society also contributed to this policy. In the population pyramid of Japan, people can observe a stark aging society through its narrowing base and widening top, which means that people over age 40 are gaining more weight in the population pyramid than the young population (Population Pyramid: Japan). The implications of this trend are far-reaching, affecting every part of the economic and social life in Japan. As more people enter their retirement age, the burden on the working-age population escalates, straining public finances through increased demands for healthcare and pension benefits. A shrinking workforce indicates there are fewer people to work and the overall economic output and innovation will

decrease. This demographic shift will also necessitate the government to spend more on social welfare programs, which poses an additional burden on government finance. In response to this challenging situation, the Bank of Japan turned to unconventional monetary policy, the negative interest rate, in hopes that the stimulus on innovation and investment caused by this policy will help society to create more working opportunities or invent more effective production methods that will help to increase the overall economic output of the society and mitigate the effect of the aging population challenge.

In a global view, there are other nations or regions that also explored negative interest rates, such as the European Central Bank. The Bank of Japan and the European Central Bank have a shared goal of reinvigorating economic growth and combating the specters of low inflation and deflation. These policies were intentionally designed to increase and motivate more lending, spending, and investments in Europe and Japan. Despite these common objectives, the Bank of Japan and the European Central Bank have different magnitudes in their implementation strategies, shaped by their specific economic challenges. In Europe, the ECB has gone deeper into the negative interest rate, as the ECB was trying to cope with the aftermath of the Eurozone debt crisis, which was an issue that required a stronger intervention at that time.

Figure 3: ECB immediate interbank rates. Retrieved from FRED, Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org/series/IRSTCI01EZM156N

Meanwhile, the Bank of Japan needed to take into consideration the potential effect of the negative interest rate on other sectors of the economy, so they implemented the negative interest rate more cautiously than how the ECB did in Europe.

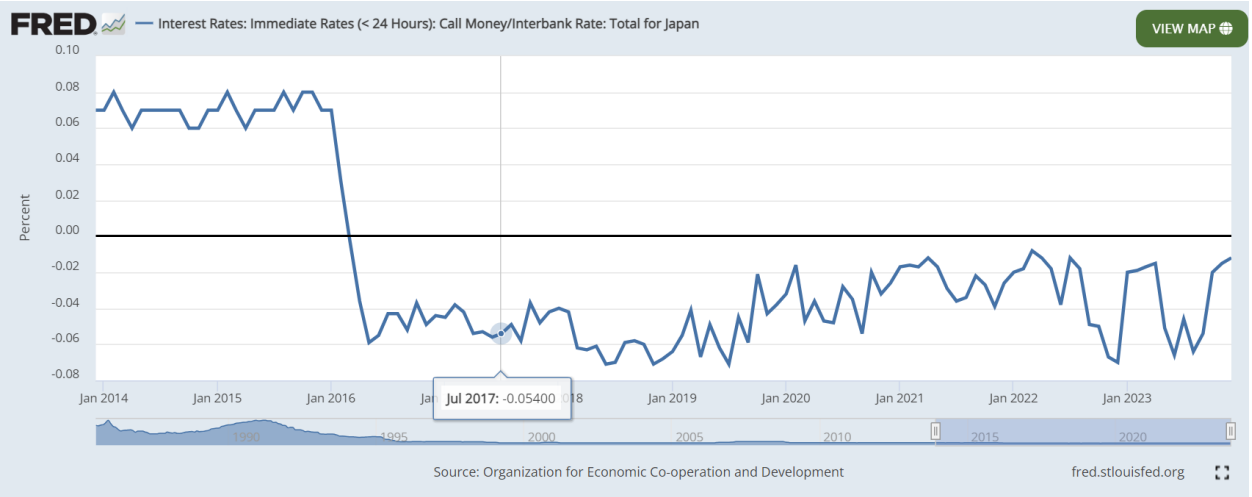

Figure 4: Japan immediate interbank rate. Retrieved from FRED, Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org/series/IRSTCI01JPM156N

In theory, it seems that a negative interest rate will solve Japan's problem with economic stagnation, but there is no free lunch in the world. The introduction of negative interest rates has had a pronounced effect on the profitability of Japanese banks, which is a fundamental challenge to Japanese banks' traditional revenue-generating mechanism. In the design of the negative interest rate, it compresses banks' interest margin (Japan's Negative Interest Rates - The Marshall Society.), which is the difference between the interest rate that banks charge on loans they extend and the interest they pay to customers' deposits. It is true that banks could also charge consumers a negative interest rate to prevent losing money or reducing profits. However, given the competitive banking environment and the natural reluctance of banks to impose negative interest rates on consumer deposits for fear of losing clients to competitors, these banks' primary revenue stream is constricted. This situation leaves banks in a precarious position, as the cost of attracting and retaining clients significantly rises, but the income generated from their assets reduces. Moreover, with the Bank's policy rate set in negative territory, there is a suppression of yield

across a broad spectrum of financial assets, not least government bonds. The lower yields on government bonds, combined with the narrowed interest margins, compound the financial pressures on banks, curtailing their ability to generate profit from their core banking operations.

Preventing an increase of riskier investments from getting out of control was another reason that the Bank of Japan was cautious about going deep into the negative interest rate policy (What does Bank of Japan hope to gain by imposing negative interest rate?). As a negative interest rate makes hoarding money not beneficial to people, they may get propelled to seek higher yield beyond the domestic market's low return environment. In particular, Japanese banks and institutional investors have expanded their investments in oversea lending and investments. This strategic entering into the international financial market is a double edged sword, which on one hand offers Japanese investors profits higher than they could get domestically, but it also puts these investors vulnerable to issues such as currency fluctuations and geopolitical instability that may undermine these investors' benefits. Therefore, the Bank of Japan has been carefully adjusting and manipulating its negative interest rate policy and also monitoring the financial market to not make the policy drive away too many investors toward the international financial market.

Although the negative interest rate policy was a major tool that the Bank of Japan used to combat economic stagnation, there are also other strategies that the Bank of Japan tried, including the Yield Curve Control. This policy primarily targets the yield of long term bonds in Japan to keep it low. This is a signal sent out by the Bank of Japan to investors and borrowers that the central bank would not abruptly vary the cost of borrowing money in the future, which alleviates people's doubt on having higher borrowing cost, and encourages more borrowing, spending, and investments. As seen in Figure 5, Yield Curve Control did reduce the volatility and overall interest rate on long-term bonds. Nonetheless, the Yield Curve Control strategy also has the potential to erode banks' profitability similar to that of the negative interest rate approach.

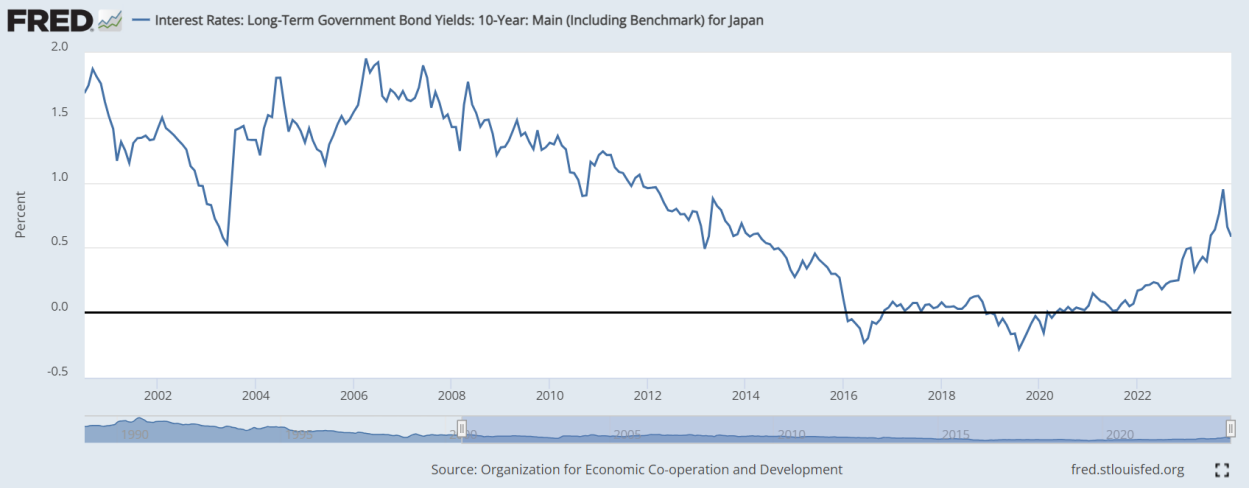

Figure 5: Interest rate on 10-year Japanese government bonds. Retrieved from FRED, Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org/series/IRLTLT01JPM156N.

3 Have These Policies Worked?

To determine whether negative interest rates have worked to stimulate the economy, we can look at data on the exchange rate, bank deposit rate, GDP, and inflation rate of Japan. One concern that Japan has that relates to stimulating the economy is keeping the exchange rate steady. For an island country, Japan needs both imports and exports for their economy to thrive, so a volatile exchange rate, that they previously had, would worsen the economy. Figure 6 is a graph of the exchange rate in Japan over time before and after negative interest rates were implemented (Negative Interest Rates: Taking Stock of the Experience So Far, Brandao-Marques et. al, Pg 28). For the years prior to NIRP being implemented (2015 and earlier), the exchange rate had large spikes, the largest in 2009 and 2013. However, after negative interest rates were implemented, the exchange rate remained steady. Therefore, in terms of the exchange rate, negative interest rates were successful.

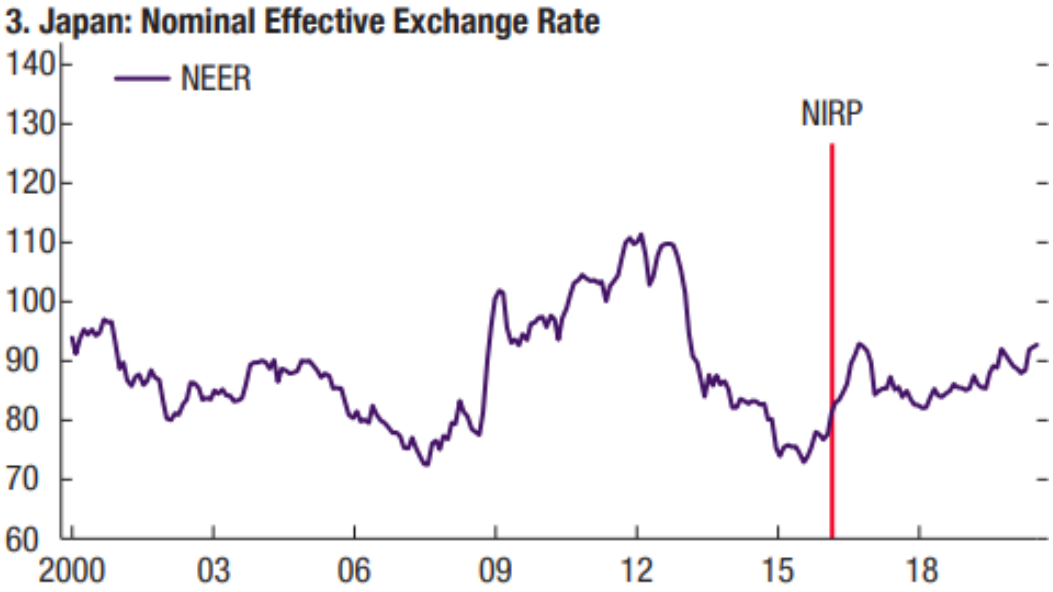

Figure 6: Japan's Nominal exchange rate. Retrieved from Brandao-Marques et al., "Negative Interest Rates: Taking Stock of the Experience So Far." IMF, No. 21/03.

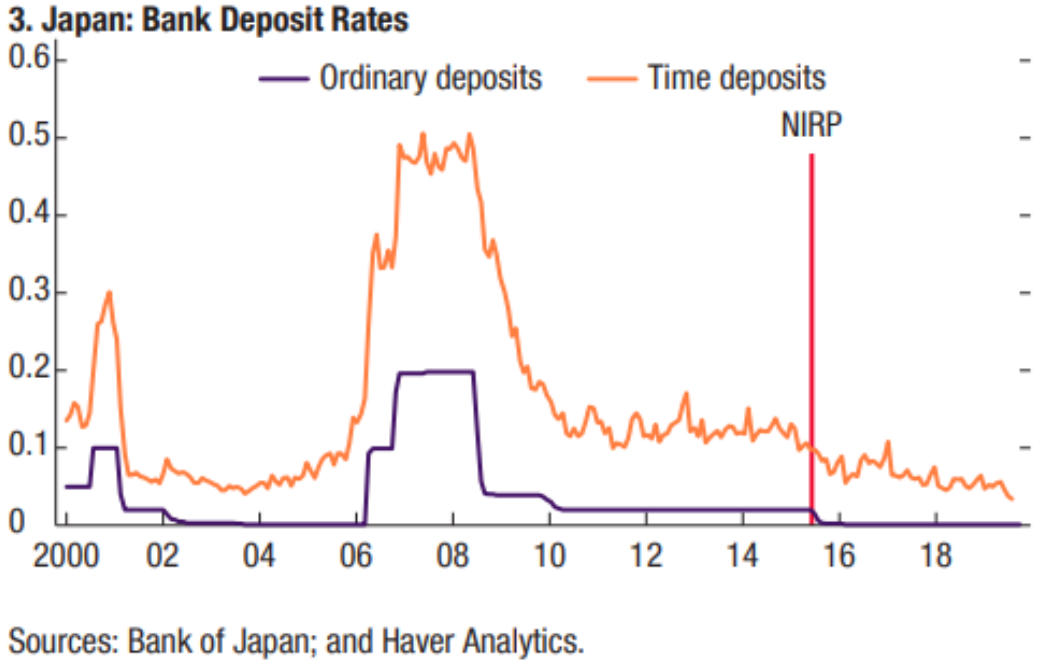

Figure 7: Bank deposit rates in Japan. Retrieved from Brandao-Marques et al., "Negative Interest Rates: Taking Stock of the Experience So Far." IMF, No. 21/03.

Another aspect of negative interest rates that the Bank sought to utilize was reducing bank deposits, as people would maintain their money's value if they kept cash instead and hopefully spend that cash. To the first part of this cause and effect chain, negative interest rates in Japan did decrease bank deposits (Negative Interest Rates: Taking Stock of the Experience So Far, Brandao-Marques et. al, Pg 33). As Figure 7 shows, prior to interest rates being negative, there was a large fraction of Time and Ordinary deposits made, but after negative interest rates were implemented, those quickly fell to 0 for Ordinary deposits and close to 0 for Time deposits. Thus, negative interest rates have decreased the amount of deposits in their banks, but has the economy been stimulated and are people actually spending more money?

We can then evaluate Japan's real GDP to determine. Japan's real GDP for the last 25 years has been steadily increasing. However, after negative interest rates were implemented, their economy stagnated:

Figure 8: Japan Real GDP with marker indicating when negative rates were implemented. Retrieved from FRED, Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org/series/JPNRGDPEXP

Aside from the dip in economic growth due to the COVID-19 Pandemic, Japan's real GDP has remained around the 550,000 yen mark. This does not look promising for whether negative

interest rates have worked to stimulate Japan's economy, but there is one more feature of the economy that can be examined: inflation.

As previously mentioned, Japan struggled with deflation for a long time and this is one of the big reasons negative interest rates were brought in. Figure 9 shows that the data on Japan's inflation indicates that negative interest rates have worked (Statistics Bureau of Japan):

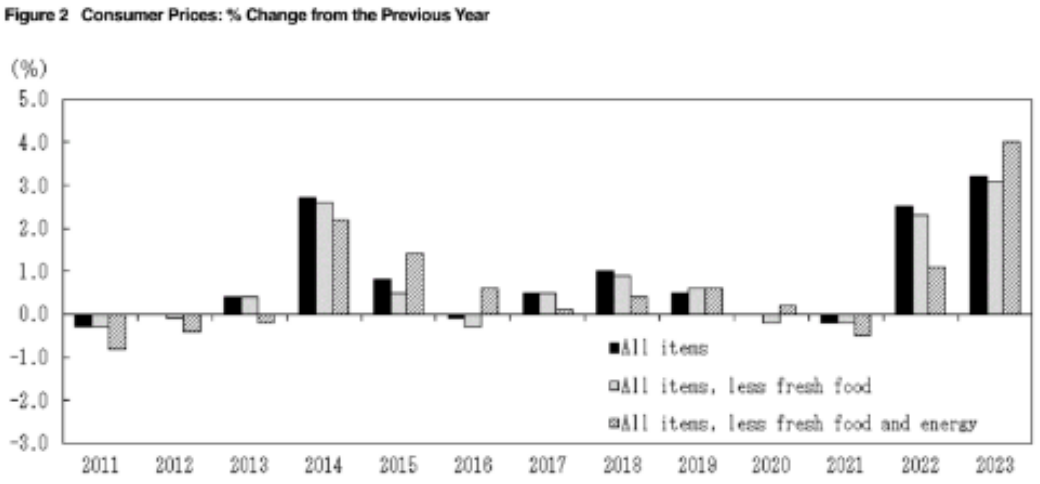

Figure 9: % change in consumer prices. Retrieved from the Statistics Bureau of Japan.

When negative interest rates were introduced in 2016, there was an increase of about 0.5-1% in prices, which means that more people were spending their money and this trend continues slowly through 2019. Unfortunately, the COVID-19 Pandemic caused many households to save their income instead of spending it which resulted in a decrease in inflation. Despite this, once the lockdown began to ease and borders for travel reopened, Japan's inflation increased tremendously. Whether this was due to increased tourism or their citizens taking money out of savings and spending it, more money was being spent and circulated.

Overall, despite the stagnation of real GDP, the rest of the data points to negative interest rates being successful in fixing a few of the problems Japan's economy was facing. With this increase in economic stimulation, the Bank is reluctant to increase interest rates yet and wants to see more data to support that the economy has gotten stronger.

Turning to examine whether Japan's second strategy to stimulate their economy has worked, we turn to analyze data on Japan's Yield Curve Control. The goal of buying as many large securities as possible is to lower the long term interest rate. Moreover, the goal of lowering the long term interest rate is to not only also lower the short term interest rate, but also help stimulate the economy by disincentivizing buying bonds, as the yield on those securities will be small. Figure 10 is a graph of the yield from 2-year and 10-year generic government bonds (Negative Interest Rates: Taking Stock of the Experience So Far, Brandao-Marques et. al, Pg 33). Japan's interest rates were coming down before the implementation of yield curve control, but both long term and short term rates came down significantly after implementation. Using this data, it would be pretty clear that Japan's Yield Curve Control has worked in bringing down interest rates. However, this data is a little outdated, so we should analyze some newer data:

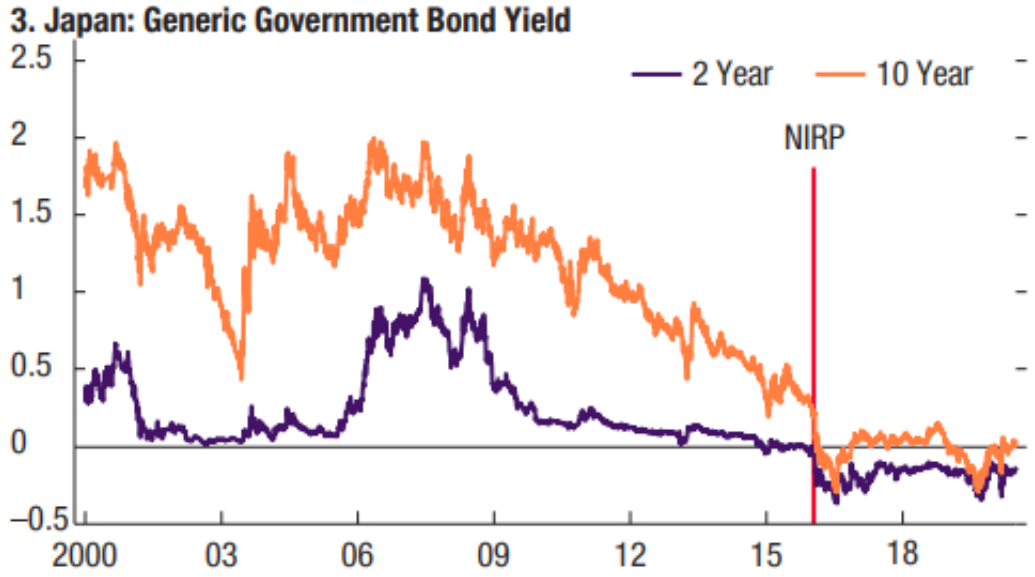

Figure 10: Yield on government bonds before and after negative rates. Retrieved from Brandao-Marques et al., "Negative Interest Rates: Taking Stock of the Experience So Far." IMF, No. 21/03.

Figure 11: Interest rate on 10-year Japanese government bonds. Retrieved from FRED, Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org/series/IRLTLT01JPM156N

Figure 11 shows that the long-term government bond yield for 10-years in Japan did sharply decrease in 2016 from yield curve control being implemented. Unlike in the U.S, Japan's long term interest rates stayed near zero or below zero up until 2022. So it is clear that at least for some time yield curve control kept long term interest rates low. Unfortunately, as I showed before, Japan's real GDP has not increased significantly since implementing Yield Curve Control.

One interesting aspect of Japan's long-term yield data that should be examined further is the slight upswing in interest rates beginning in 2022. Japan's hard cap for their Quantitative and Qualitative Monetary Easing policy is at 0.25% which 2022 was nearing. The Bank was still sticking to their policy, so why was there an increase in the long-term interest rate? Our prediction is similar to the one of Nikkei Japan that economists were expecting the Bank to change their policy due to the increase in inflation and decrease in the savings ratio of households, as seen in Figure 12 ("Japan to Raise Assumed Rate for Debt-Servicing to 1.9%"). Economists in Japan and throughout the world see that Japan's economy is appearing as though it will strengthen and surveying them reveals the same (OECD Economic Outlook No. 114 database).

Output gap	..	-1.9	-1.5	-0.1	0.5	1.2
Consumer price index	..	-0.2	2.5	3.2	2.6	2.0
Core consumer price index[2]	..	-0.7	0.3	2.7	2.3	2.0
Unemployment rate (% of labour force)	..	2.8	2.6	2.6	2.5	2.4
Household saving ratio, net (% of disposable income)	..	7.8	5.2	2.8	2.3	0.7
General government financial balance (% of GDP)	..	-6.2	-5.7	-5.2	-4.3	-3.3
General government gross debt (% of GDP)	..	239.3	244.8	243.5	243.3	242.3
Current account balance (% of GDP)	..	3.9	1.8	3.4	3.8	3.9

1. Contributions to changes in real GDP, actual amount in the first column.
2. Consumer price index excluding food and energy.
Source: OECD Economic Outlook No.114 database updated to take into account the 8 December 2023 Japanese national accounts release.

Figure 12: Japan CPI data 2021-2025 (prediction for 2025). Retrieved from Nikkei Japan, OECD Economic Outlook No. 114

The CPI in Japan is increasing and the portion of income saved is decreasing. Economists expect this trend to continue throughout 2024 and 2025 (OECD Economic Outlook No. 114). These expectations are in line with our prediction that long-term interest rates had an upswing because the economy expects that the Bank of Japan will loosen policy in the near future and the economy will become much stronger.

Using this data and what we have learned about negative interest rates and yield curve control, it is clear that both strategies have worked to an extent, but not enough to strongly stimulate the economy. That is why the Bank of Japan will not be loosening policy in the near future and they have made that clear. It will be interesting to watch Japan's economy and later see if they are affected by the long term effects of both negative interest rates and yield curve control.

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