

13 July 2020

Negative Interest Rate Policy (NIRP)

An unorthodox monetary policy, defying traditional financial perceptions

Summary

- In view of the unprecedented global economic crisis triggered by the COVID-19 pandemic, some central banks are weighing the option of adding the NIRP in their policy toolbox as they have reached their limits of monetary easing.
- Considered unconventional, in the aftermath of the Global Financial Crisis and with policy rates nearing the zero lower bound, some central banks have applied NIRP to either stimulate inflation or weaken its currency.
- The pass-through of NIRP was clear in the money market (overnight interbank rate shifted down similar to when central banks were executing conventional rate cuts) and debt market (negative-yielding bonds account for about 20-25% of worldwide government bonds), but rather limited from the deposit perspective (corporate and household deposit rates have mostly remained positive, with household deposit rates exhibiting some downward rigidity).
- The transmission of NIRP was limited via the lending channel (no evidence of an expansionary impact on the amount of loans), but more apparent via the exchange rate (domestic exchange rate depreciated due to the large net outflow of money) and portfolio rebalancing channels (investors switched to riskier assets with higher expected returns).
- In a risk-on mode, there is a relatively higher probability of funds moving out from a market that adopts NIRP into emerging market high yield assets. However, the relocation of risk trade would likely be into a less volatile asset class or EM's government bonds.
- The typical expansionary effects of rate cutting have been partially capped by the unintended consequences of NIRP, such as low inflation expectations, shrinking bank margins and cash hoarding.

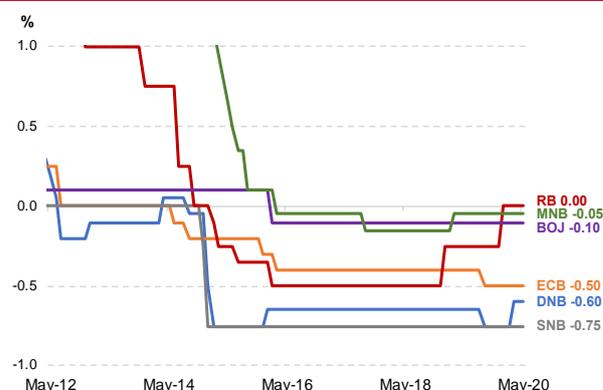
Introduction

- **Negative interest rate policy (NIRP) is back in the limelight as ammunition-exhausted central banks deliberate on mechanisms to enhance monetary easing** in weathering the economic downturn triggered by the COVID-19 pandemic.
 - Some central banks (e.g. Federal Reserve, Reserve Bank of Australia) have publicly opposed the idea of going below zero, while others continue to keep it as an option (e.g. Bank of England, Reserve Bank of New Zealand).
- **This report aims to act as a primer on the NIRP** by diving into the origins, impacts and risks associated with the unorthodox monetary policy, as experienced by economies that have already adopted the NIRP.

Emergence of NIRP

- **In the aftermath of the 2007-2008 Global Financial Crisis, the advanced economies were caught up in an environment of hampered growth and subdued inflation.**
 - With limited fiscal space and policy rates nearing the zero lower bound, central banks of major advanced economies resorted to introduce new, unconventional monetary policy instruments, ranging from asset purchases programmes, forward guidance, lending operations and NIRP.
- **NIRP was first adopted in 2012 by the Danmarks Nationalbank (DNB). Since then, the European Central Bank (ECB), Swiss National Bank (SNB), Riksbank (RB), Bank of Japan (BOJ) and Hungarian National Bank (MNB) have followed suit.**
 - Of the total six central banks, one central bank (RB) has left the negative rate territory in December 2019, after five years of implementing the NIRP, marked by its achievement of meeting the inflation target.
 - Notably, these central banks embarked on the uncharted route of negative rates with varying end-goals and some variations in the implementation mechanism of NIRP, as illustrated in the table below.

Graph 1: Rate on Excess Reserves



Source: DNB, ECB, SNB, RB, BOJ, MNB, CEIC, Kenanga Research



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Table 1: Cross-Country Comparison of NIRP

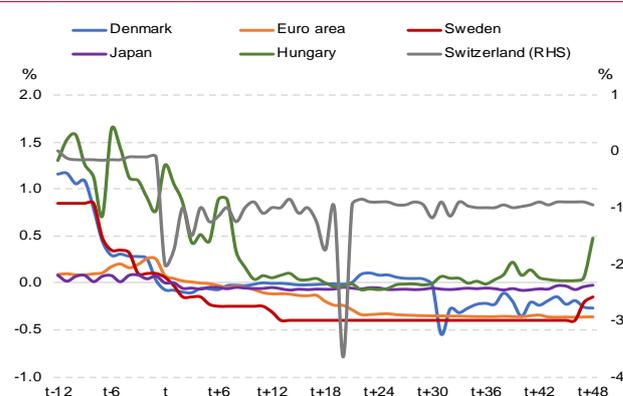
Country	Period	Goal	Mechanism
Denmark (DNB)	5 Jul 2012 - today	To curb the appreciation of the DKK against the EUR, defending the European Exchange Rate Mechanism (ERM) 2, which pegs the DKK to the EUR at a central rate of 7.46038 kroner per euro with a $\pm 2.25\%$ fluctuation band	DNB sets individual current-account limits for each bank and an overall limit for the banks' total current-account deposits. If the overall current-account limit has been exceeded, each bank's current-account deposits exceeding the individual limit will be converted into certificates of deposit and charged the negative rate
Euro area (ECB)	5 Jun 2014 - today	To stimulate inflation, lifting it close to but slightly below 2.0% over the medium term	Two-tiered system: <ul style="list-style-type: none"> 0%: charged on excess reserves up to the allowance (i.e. minimum reserve requirement times a multiplier of 6) Deposit Facility Rate (i.e. negative rate): charged on excess reserves exceeding the allowance
Switzerland (SNB)	18 Dec 2014 - today	To curb the appreciation of CHF against the EUR, defending the minimum exchange rate of CHF1.20 per EUR (the cap was scrapped in Jan 2015)	Negative rate levied on sight deposits exceeding 30 times more than the minimum reserve requirement
Sweden (RB)	12 Feb 2015 - 19 Dec 2019	To stimulate inflation, lifting it closer towards 2.0%	Negative rate imposed on all deposits placed via the purchase of Riksbank Certificates and overnight deposits
Japan (BOJ)	16 Feb 2016 - today	To stimulate inflation, with the ultimate objective of bringing it to 2.0%	Three-tiered system: <ul style="list-style-type: none"> 0.1%: charged on basic balance (pre-existing) 0.0%: charged on macro add-on balance (required reserves and reserves associated with BOJ loan support scheme) -0.1%: charged on policy-rate balance (current account balance exceeding basic and macro add-on balances)
Hungary (MNB)	22 Mar 2016 - today	To stimulate inflation, bringing it within \pm one percentage point from 3.0%	Negative rate applied on overnight deposits

Source: DNB, ECB, SNB, RB, BOJ, MNB, Kenanga Research

• **Pass-through of NIRP was clear in the money market and debt market, but rather limited from the deposit perspective**

- **Short-term money market:** The money market remained functional, transmitting the negative policy rate towards the overnight interbank rate in an orderly manner, similar to when central banks were executing conventional rate cuts.
- **Bond yields:** The NIRP has effectively demolished non-negativity restriction on rates, rendering a more prominent downshift in the government bond yields. Globally, bonds yields are at historic low level, with negative-yielding bonds gaining traction, accounting for about 20-25% (peaked on 29 August 2019: USD17.0t) of worldwide government bonds.
 - Amongst the NIRP economies, Denmark registered the largest degree of downturn (-102bps) in its 10-year yield, four years after the implementation of NIRP.
 - This trend was also visible across the yield curve, whereby both shorter and longer-dated bonds have found a home under the zero lower bound, excluding Hungary. However, the downward trend was not solely attributable to the NIRP, as the yield was also pressured by central banks' asset purchase programmes and investors flocking to low-risk assets largely deemed as safe havens in episodes of elevated uncertainty.

Graph 2: Overnight Interbank Rate

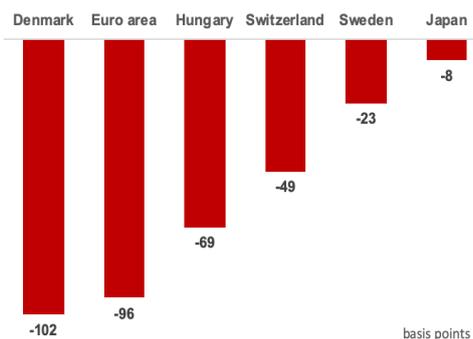


*t=month of NIRP implementation

Source: CEIC, OECD, FRED, Kenanga Research

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Graph 3: Change in 10-year Government Bond Yield (t+48 - t)



*t=month of NIRP implementation
Source: Bloomberg, Kenanga Research

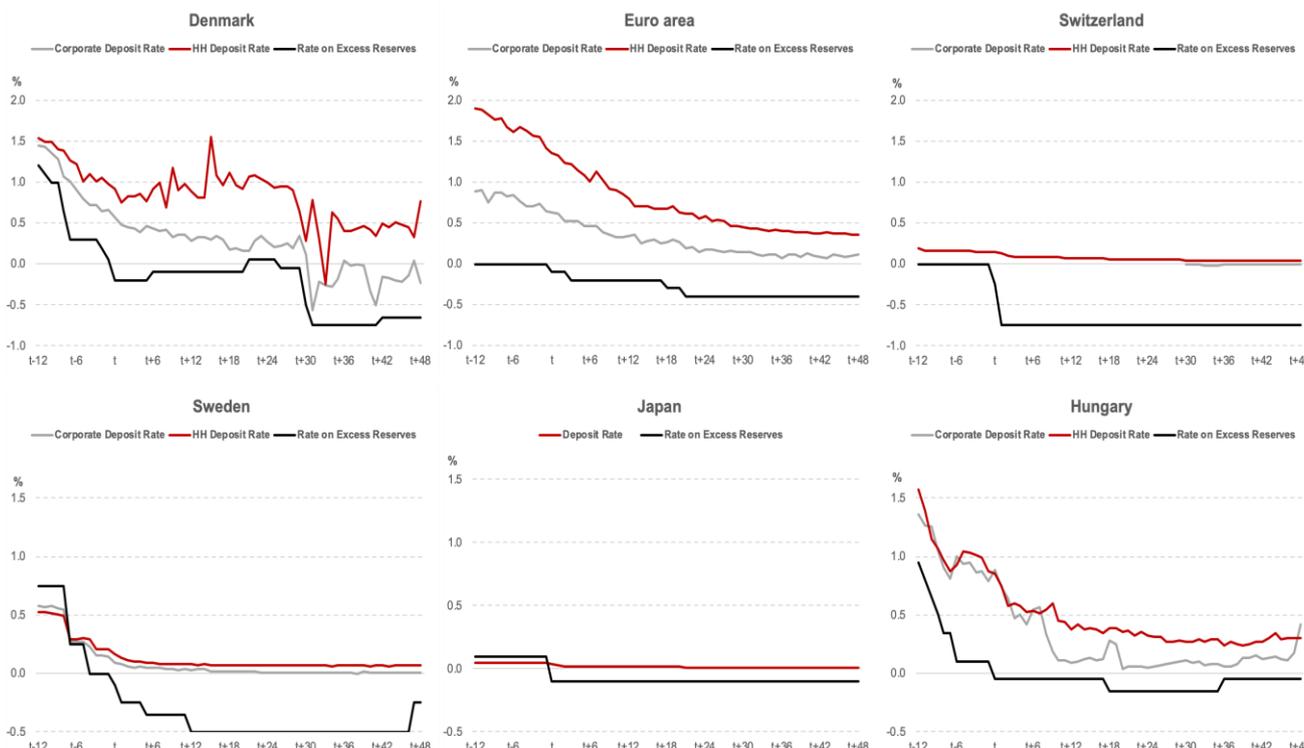
Table 2: Government Bond Yields

Maturity (Yr)	1	2	3	4	5	6	7	8	9	10
Switzerland	-0.8	-0.7	-0.7	-0.6	-0.6	-0.6	-0.6	-0.5	-0.5	-0.5
Euro area	-0.5	-0.7	-0.7	-0.7	-0.7	-0.7	-0.6	-0.6	-0.5	-0.5
Denmark	-0.5	-0.6		-0.6	-0.5			-0.4		-0.3
Sweden		-0.4			-0.3	-0.3		-0.2		-0.1
Japan	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0
US	0.2	0.2	0.2		0.3		0.5			0.7
Hungary	0.4		1.0		1.4					2.1

*June 2020
Source: Bloomberg, CNBC, Kenanga Research

- **Deposit rate:** As central banks shifted their deposit rates to below zero, commercial banks are naturally expected to move in tandem, passing on the cost to their customers' deposits. However, this was not the outright case experienced by the six aforementioned economies.
 - While corporate and household deposit rates have charted a downtrend, rates for all countries, excluding Denmark, have remained in the positive territory, and there seemed to be a degree of downward rigidity for household deposit rates, reflecting banks' fear of a deposit flight, given that households face lower opportunity cost of converting deposits into cash as their deposits are smaller in scale, hence bearing limited storage costs.
 - For countries with pre-existing low deposit rates (e.g. Switzerland, Japan), central banks' NIRP did not have much impact in discouraging savings, as the deposit rates had very little room to move and banks were reluctant to go further down.

Graph 4: Average Deposit Rates



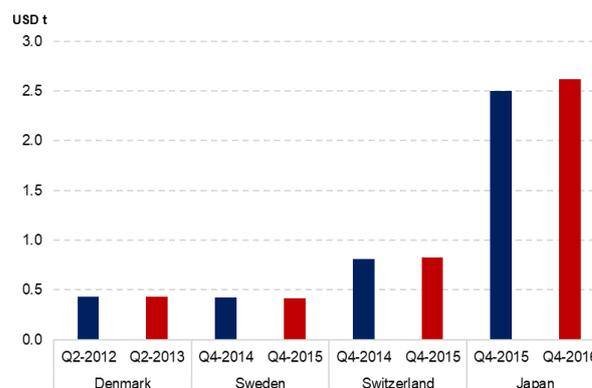
*t=month of NIRP implementation
Source: DNB, ECB, SNB, RB, BOJ, MNB, Kenanga Research

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Transmission Channels

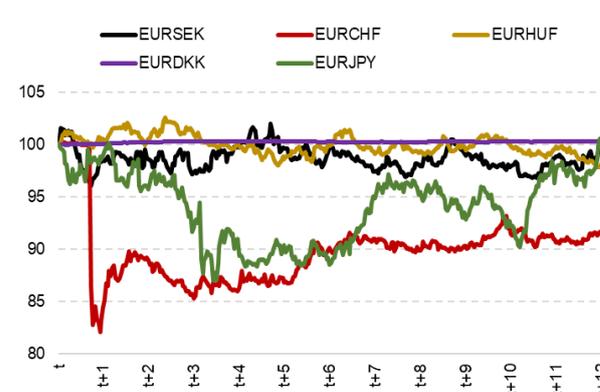
- **Lending channel:** Banks are encouraged to lend out their excess reserves while savers are discouraged from saving, due to declining returns on deposits.
 - Bank lending channel remains operational under NIRP, with no major upward or downward movement in the amount of total loans. To start, the lending channel is affected by two forces. On one hand, the fall in bank interest rate into negative territory will exert pressure on bank deposits. Depositors will opt to store cash or move their money elsewhere (e.g. stocks, gold) instead of depositing it in the bank. On the other hand, the erosion of banks' profitability brought about by the decline in net interest margin will, over time, be transmitted to a decline in bank equity. This leads to upward pressure on the lending rate. The equilibrium behavior of the lending rate depends on the relative importance of the two forces.
- **Exchange rate channel:** Foreign exchange market could act as a barometer of a country's monetary policy effectiveness relative to other countries.
 - Gauging the impact of the implementation of NIRP on the exchange rate is complicated since there are many factors that can influence the currencies' demand. However, it is clear that negative rates will result in capital flight, as foreign investors flee and seek higher returns elsewhere, depreciating the currency as evidenced in most European countries. One should think of two major transmission process that operate through the exchange rate channel, its effects on net exports and balance sheet.
 - In the current economic climate of free capital flows and flexible exchange rate, it is important to look at how monetary policies affect exchange rates, which in turn affect net exports, aggregate output and prices. However, this channel does not operate when the exchange rate is fixed or heavily managed, and the more open an economy is the stronger this channel might become.
 - An easier domestic monetary policy makes holding assets denominated in domestic currency less attractive relative to assets denominated in foreign currencies with comparatively higher interest rates. As a result, the lower value of the domestic currency makes domestic goods cheaper relative to foreign goods thereby prompting a rise in net exports and hence aggregate spending.
 - The negative impact of policy-induced changes in exchange rates may exert significant balance-sheet effects in both financial and non financial firms. With debt contracts denominated in foreign currency, depreciation of the local currency can decrease the firms' net worth and increase the debt burden of domestic borrowers, leading to a significant adjustments in spending and borrowing. This weakening in balance sheet positions may induce an increase in moral hazard incentives, which can lead to a decline in investment and overall economic activity.
- **Portfolio rebalancing channel:** Declining government bond yields incentivise investors to seek higher yielding and riskier assets such as equities, corporate bonds or property.
 - One of the most important functions of interest rates is the fact that it determines the amount of income paid to investors that are investing in the bond market. Due to NIRP, bond markets in Europe and Japan are offering unattractive low real yields.

Graph 5: Household and NPISHs Total Loans



Source: OECD, Kenanga Research

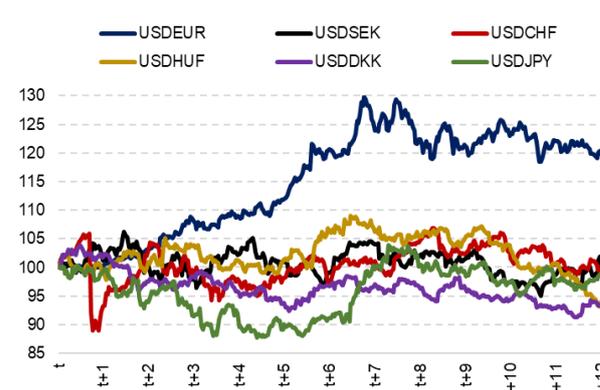
Graph 6: FX Indices Relative to Euro



Source: Bloomberg, Kenanga Research

Note: The x-axis shows 30-day intervals, t=100 (a day before introduction of NIRP)

Graph 7: FX Indices Relative to Dollar



Source: Bloomberg, Kenanga Research

Note: The x-axis shows 30-day intervals, t=100 (a day before introduction of NIRP)

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- With today's ultra low bond yields, investors will seek to invest in other instrument that offers the highest yield for the same level of risk. However, with negative rates which in turn results in negative yield, investors desperate for income are ignoring the risks. To note, with negative-yielding bonds, investors are guaranteed to receive less money in the future, if they hold the bond until maturity. Hence, most investors are forced to shift their money out of this lower-yielding bonds into a riskier financial assets, mainly equities in the quest for higher yield. These are a major concern with serious ramifications.
- Meanwhile, global funds with a more diverse portfolio would alternatively switch their focus towards a relatively higher yielding and oftentimes riskier emerging market assets. And this happens whenever the financial markets switch to a risk-on mode. As a result, there is a relatively higher probability of funds moving out from a market that adopts NIRP in the event of a risk-on into EM high yield assets. However, the relocation of risk trade would likely be into a less volatile asset class namely EM's government debt rather than stocks.

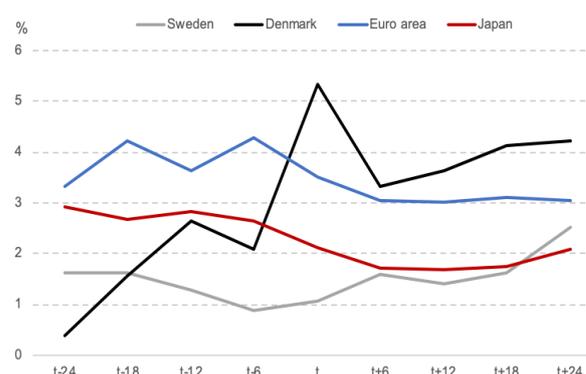
Table 3: Stock Market Performance Following NIRP

	Euro area	Sweden	Switzerland	Hungary	Denmark	Japan
Before NIRP	3237.9	1593.0	8775.9	25832.4	459.6	16022.6
After 1Y	3510.0	1286.7	8608.9	31827.1	526.6	19347.5
Changes (%)	8.40%	-19.23%	-1.90%	23.21%	14.58%	20.75%

Source: Bloomberg, Kenanga Research

Unintended Consequences of NIRP

- **Low inflation expectations:** Negative rates could keep inflation expectations low even as some central banks use it as an inflation raising tool.
 - Inflation expectations are an important determinant of actual inflation, as firms and households consider the expected rate of inflation when making economic decisions, affecting the real rate of inflation.
 - Data indicates that inflation expectations have declined in a number of countries following the introduction of NIRP. Graph 8 shows the household inflation expectations (based on household surveys) for Sweden, Denmark, the Euro area and Japan in the 24 months before and after the introduction of negative interest rates.
 - Denmark and the Euro area showed downward trends in inflation expectations after imposing negative rates, with Denmark exhibiting a very steep decline that likely worked against the expansionary effects of negative interest rate policy. Sweden, which has been relatively successful in implementing negative interest rates did see inflation expectations rise.
 - Japan has had a long running low inflation issue, and after failing to achieve a sustained increase in inflation expectations with policy rates already at zero, the BOJ moved to negative rates in January 2016. This movement resulted in decreased, rather than increased, of immediate and medium-term expected inflation, which in turn kept real inflation rates down.
 - Negative interest rates could be limited in its expansionary powers as it is held back by flat or falling inflation expectations resulting from a rate cut into negative territory.
- **Shrinking bank margins:** Retail banks in negative rate environments may have to absorb declining margins between borrowing and lending, which could harm their earnings and lead to a substantial restructuring of their business model.
 - Banks are hesitant to pass negative rates onto consumers, due to competition between other banks and the option for clients to hold liquidity in cash withdrawals, thereby bearing the costs of negative interest rates themselves. They also incur direct costs for holding excess reserves with central banks; by 2019 banks in Switzerland have been charged over CHF1.0b as a result. Negative interest rates have also resulted in a direct decline in interest margins, a key source of revenue for banks, all of which exacerbate their profitability woes.

Graph 8: Inflation Expectations

*t = month of NIRP implementation

Source: Coibion (2019), Kenanga Research

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- Graph 9 shows the consolidated net interest income (% of total income) for euro area banks, a measure of bank profitability. Prior to the implementation of negative rates in the euro area on 4 June 2014, net interest income was high and relatively stable (between 1.3% – 1.09%), however once negative rates were implemented a sharp fall (to 0.3%) by 2015 can be seen, remaining volatile ever since. This indicates that negative interest rate policy may have had a destabilising effect on bank profitability.
- Negative rates are also implemented to stimulate the economy via facilitation of demand growth for bank loans. However, research shows that compressed bank margins led to limited loan growth, with a decline in profits eroding capital bases and further limiting credit growth. This can further suppress any positive impact on domestic demand that comes from NIRP monetary transmission effects.

Graph 9: Euro Area Banks Net Interest Income

Source: ECB, Kenanga Research

- It should be noted that a recent OECD study on euro area banks concluded that the estimated effects of negative rates on profitability do not indicate a significant overall impact, as banks have mobilised sources of non-interest income (via fees and commissions) to help sustain profitability.

- **Cash hoarding:** Economists reason that consumers and institutions will hoard cash when confronted with negative interest rates. Such an occurrence has not happened so far, but signs of it emerging have appeared.
 - In a negative interest rate environment, the zero-interest characteristic of cash becomes an attractive store of value rather than paying a fee to store money.
 - Regardless, no concrete evidence of cash hoarding has appeared so far. In fact, a study on cash circulation in the EU shows that the ratio of EUR500.0 notes have actually fallen since 2010 – theory posits that the ratio of high value currency would rise with increased cash hoarding – indicating that there may even be less cash storage of late.
 - One reason cash hoarding may not have occurred is that banks have not actually passed on negative rates onto retail customers thus far. However, this could soon change as banks across Europe have announced that they will start charging retail depositors a negative rate. Furthermore, banks themselves could store large amounts of cash to avoid negative rates on their reserves at the central bank; German institutions, Commerzbank and Munich Re, are reportedly considering storing larger amounts of currency in vaults.
 - The longer negative rates are maintained, the more likely it is for banks to charge retail depositors a negative rate (in a bid to offset falling margins) and the more likely banks and their customers are to switch to holding cash.

For further information, please contact:

Wan Suhaimie Wan Mohd Saidie
Head of Economic Research
wansuhaimi@kenanga.com.my

Atiqa Noor Azlan
Economist
atiqa.noorazlan@kenanga.com.my

Muhammad Saifuddin Sapuan
Economist
saifuddin.sapuan@kenanga.com.my

Afiq Asyraf Syazwan Abd. Rahim
Economist
afiqasyraf@kenanga.com.my

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KENANGA INVESTMENT BANK BERHAD (15678-H)

Level 17, Kenanga Tower, 237, Jalan Tun Razak, 50400 Kuala Lumpur, Malaysia
Telephone: (603) 2172 0880 Website: www.kenanga.com.my E-mail: research@kenanga.com.my

