Investment Research

By Maxime Alimi and the Research & Investment Strategy team

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The brave new world of negative interest rates

Key points

- Five central banks have introduced negative interest rates, triggering significant debates about their relative costs and benefits.
- Implementation has been smooth so far and rate cuts have been channelled to the economy through currencies and financial markets.
- A major concern revolves the potential hit to banks' profitability from lower net interest income. In our view, negative rates will ultimately be passed to customers if they persist.
- The effectiveness of negative rates is limited as long as physical cash is not taxed. Operational hurdles are surmountable, but political opposition is a key unknown.
- Most risks associated with negative rates will only emerge over time. This supports a short, aggressive response from central banks, as opposed to gradualism.

Exhibit 1
A bird's eye view of negative interest rates

Channel	Expected benefit	Expected risk
Exchange rate	Currency depreciation	Currency wars, liquidity trap contagion
Signalling	Lower yield curve	Central bank credibility
Bank lending	Cheaper credit conditions	Banks' profitability and risk appetite
Asset valuation	Wealth effects, confidence	Financial instability, financial repression, fiscal sustainability
Risk-taking	Portfolio rebalancing	Asset bubbles

Source: AXA IM Research

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How monetary policy became an ugly contest

The market correction in early 2016 had several causes, one of which was the perception of central bank's impotency. After seven years of zero interest rate policy (ZIRP) and unconventional measures, global growth remains sluggish and inflation below target in most countries. In such a context, several central banks have started to introduce negative interest rate policies (NIRP). Whether NIRP is a reflection of despair among policymakers failing on their mandate or a smart policy innovation has sparked debate (see *Box B*).

However, market pessimism may have to do with the chronology of central bank policy since the financial crisis, which effectively puts NIRP as a de facto fourth best option after cutting interest rates to zero, quantitative easing (QE) and forward guidance. This is despite a rich and sophisticated academic literature on negative interest rates dating back to German economist Silvio Gesell in 1916[1].

The cost-benefit analysis of NIRP is important in the context of a prolonged period of over-extended monetary policy. Were a new shock to hit the economy, requiring additional monetary easing, several directions are possible (see *Box A*):

1. Raise the inflation target to a higher level or adopt price level targeting[2];
2. Push further on unconventional policies via additional QE, explicit debt monetisation or its most extreme version, helicopter money[3];
3. Break through the lower bound of interest rates.

Extensive discussions on the above policy options are beyond the scope of this piece, which will focus on the last point. But for all of them, it is generally admitted that benefits are likely to come through quicker than costs and risks. As a result, speed of implementation, effect and exit are key, so as to bring the economy back to its normal state where the first-best policy tool – positive interest rates – can be used.

This last point is most likely an important weakness of balance sheet policies and QE, for which an exit strategy is very long and unchartered, raising the question of whether one quick shot of more extreme policies is not preferable to decades of "vanilla" unconventional policies[4].

[1] Quoted by Buiter, W. and Panigirtzoglou, K., Overcoming the zero bound on nominal interest rates with negative interest on currency, The Economic Journal, 2003.

[2] On these two options, see Blanchard, O. et al., Rethinking macroeconomic policy, IMF Staff Position Note, 2010; and Woodford, M., Methods of policy accommodation at the interest-rate lower bound, Kansas Fed, 2012.

[3] See Turner, A., The case for monetary finance – an essentially political issue, IMF Jacques Polak annual research conference, 2015; and Reichlin, L. et al., Helicopter money as a policy option, Vox, 2013.

[4] See for example Kimball, M., Practical details of negative interest rates, CEPR interview, 2015.

What makes NIRP special

NIRP is primarily an extension of traditional interest rate setting, offering the same benefit to the economy as any other rate cut: it lowers short- and medium-term interest rates, pushes down the currency and boosts the price of financial assets. Cutting interest rates below zero brings however two important non-linear features compared to regular rate cuts:

1. Unless additional measures are taken, economic agents can arbitrage negative interest rates by holding physical currency, yielding zero;
2. The reversion of the creditor/debtor cash flow has psychological, legal, operational, social and fiscal consequences.

These non-linear effects make it pertinent to explore NIRP as a different regime from ZIRP. A first operational hurdle, though, is that the NIRP regime probably does not start as soon as the policy interest rate falls below zero. This is because agents would only switch to cash after taking into account the cost of storage, insurance, safekeeping, transportation and the price of convenience. These being different from one agent to another, the true effective lower bound (ELB) is estimated around -1% with large uncertainties[5].

Five economies have introduced negative interest rates since mid-2014 (Switzerland, Denmark, Sweden, the euro area and Japan) but none of them has brought interest rates lower than -0.75%. As a result, **it is likely that we have yet to see NIRP below the ELB**.

In the rest of this work, we will make a distinction between the current policy setting of "impure" NIRP and the theoretical "pure" NIRP. In the impure NIRP, policy interest rates are below zero but not below ELB, implying that no measure is taken to tax cash and remove the arbitrage between physical currency and negative interest rates.

Banks' headache

Let's start with the current impure NIRP. In this intermediate state of the world, a number of limitations appear.

First, by definition, **interest rates are still constrained by the ELB and cannot be cut by large amounts**. Mechanically, the magnitude of monetary easing delivered is limited.

Second, the pass-through of negative interest rates can be less than for positive rate changes if not properly reflected in interest rate markets. On interbank markets, there is so far little sign of weaker pass-through, although arguably trading volumes have fallen significantly. The same is true for bond markets where yield curves have smoothly incorporated negative interest rates.

[5] See Jackson, H., The international experience with negative policy rates, Staff Discussion Paper, Bank of Canada, 2015.

Box A: The case for negative rates and other options

Eric CHANEY, Group Chief Economist and Head of Research, AXA IM

The case for negative rates appears when the equilibrium rate, a concept close to Knut Wicksell's 'natural rate' (the real rate of interest which balances savings and investment at full employment), is itself negative. Then any policy rate above or at zero will generate a sub-optimal outcome (demand inferior to supply, and not because of overcapacity), triggering a vicious circle where the deflation created by insufficient demand is raising the real rate of interest, thus widening further the gap with the equilibrium rate. Eventually, market clearing will occur as a result of lower potential growth for lack of productive investment, real interest rates being too high to make investment profitable. Why would the equilibrium rate fall so low, as seems to be the case today? There are competing explanations, from the 'secular stagnation' hypothesis to the lack of innovation or a global liquidity trap. Whatever the explanation, the fact that the equilibrium rate has fallen below zero requires a policy response. For the sake of analysis, let us assume that the real equilibrium short term rate in the euro area is –0.5%, which seems to be a conservative assumption. Since euro area inflation has averaged 0% over the last twelve months, the nominal equilibrium rate is also assumed to be -0.5%. How to close the gap between the actual rate of interest and the equilibrium rate? There are four options:

1. **Convince economic agents that future inflation will be higher than today's**. If the central bank performs this trick, the real rate of interest may fall through the real equilibrium rate. Easier said than done: despite having official inflation targets and repeating over and again that they will reach their targets, central banks (CBs) have not convinced investors in indexed bonds, so far. Raising the inflation target (as suggested by Olivier Blanchard, although for a different reason) might do the trick but may also weaken long-term growth by generating higher inflation volatility and harming the central bank credibility. Another way to raise inflation expectation could be to target the price level, instead of its rate of growth (inflation). Monetary authorities would target an inflation rate higher than its target (2% for most CBs) in order to compensate for several years of inflation undershooting. So far, this option has been rejected, perhaps because central bankers are naturally conservative when it comes to their long-term strategy.

2. **Keep the short term policy rate at zero and bring down market interest rates across maturities by buying bonds regardless of their price** (QE). This has been the preferred option of the Fed, the BoJ and the ECB. But if the equilibrium rate has fallen too deeply into negative territory, a policy that can only flatten the yield curve is insufficient. Besides, in the case of the euro area, QE is not as simple as it is in monetary unions that are also fiscal unions: sharing credit risks among tax payers is a thorny matter.

3. **Ignore the zero bound and cut policy rates below zero**. By definition, this allows policymakers to close the gap and even to set a policy rate below the equilibrium rate and therefore to implement a stimulating monetary policy. In the case of the euro area and given our assumptions, this implies cutting the deposit rate, a floor for short-term rates, significantly below -0.5%. Since we discuss unwanted side effects of negative rates in the main section of this note, I will only say that as elegant as negative rates look as a theoretical solution, they may have such large unwanted effects on the financial sector, banks but also pension funds and insurers, that the patient might be dangerously allergic to the medicine.

4. **Acknowledge that monetary policy is not a silver bullet and complement it with a fiscal stimulus**. The last option is to turn things upside down: leave the policy rate unchanged, close to zero and lift the equilibrium rate by increasing debt-funded government spending, which is not in the remit of CBs. This option is advocated for by Lawrence Summers. Ideally, the fiscal stimulus should focus on long-term growth enhancing investments, such as infrastructures, education, or basic research. Practically, the rule should be to invest into projects offering a rate of return significantly higher than current market rates, which, in the current circumstances, is not excessively demanding.

If the fiscal option is ruled out for political or legal reasons, not to say ideological reasons ('government debt is evil'), the policy response can only be a mix of options 2 and 3, with unwelcome side effects. I often hear that implementing structural reforms freeing up resources and making the economy more efficient is the way out. But this cannot be true if the starting point is a lack of aggregate demand or a savings glut (two sides of the same coin): raising potential supply won't close the gap, obviously. Supply-side reforms are certainly desirable but they should come bundled with higher government spending.

More problematic is bank-intermediated credit, for two reasons. First, banks are generally wary of passing negative interest rates onto deposit accounts for retail clients, for whom the ELB is likely closer to 0% than for corporates or institutional investors. They thus seek to avoid deposit withdrawals that would have to be replaced by wholesale funding that is both more risky and expensive.

As a result, the cost of NIRP is borne by banks instead of being burdened by the broader economy. This implies a negative impact on banks' profitability, especially in a context of QE whereby more reserves are forced[6] onto financial institutions every month. As the financial crisis

[6] Total excess reserves at the central bank do not reflect banks' (lack of) lending propensity but are almost entirely determined by the central bank's actions (QE, LTRO); see Keister and McAndrews (2009) for illustrative examples.

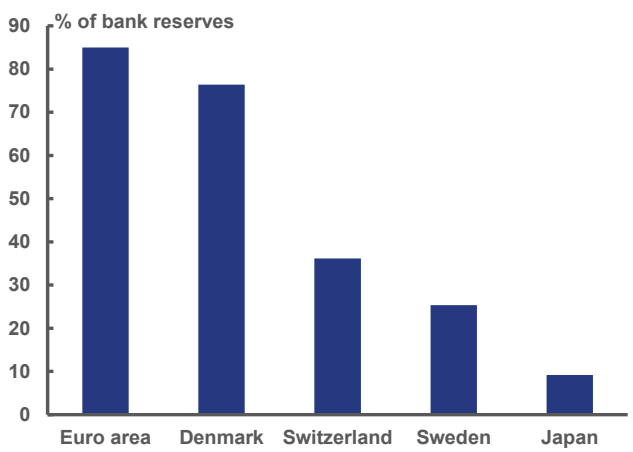
showed, **weak bank profitability typically leads to low risk appetite and in turn tighter credit conditions for risky borrowers**, in particular SMEs[7]. Second, banks will be tempted to maintain their margins by also not passing through lower interest rates to their borrowing clients, reducing the easing benefit for the real economy.

From the central bank's perspective, banks would ideally fully pass negative rates to their clients so as to increase their incentive to spend. The fact that they do not and corresponding negative side-effects are problematic, to the point that some observers conclude that NIRP is counter-productive.

To address this side effect, central banks have come up with mitigating schemes, notably tiered deposit interest rate systems, which means that the share of bank reserves charged at negative rates can be quite limited (*Exhibit 2*).

Exhibit 2

Bank reserves not all charged at negative rates



Source: Bank of Japan and AXA IM Research
Note that only excess reserves, that is, on top of regulatory required reserves, are subject to a negative rate (a tax). In constituencies where the consolidated banking system is holding a large amount of excess reserves, because of a QE policy for instance, the share of taxed reserves is higher, other things being equal.

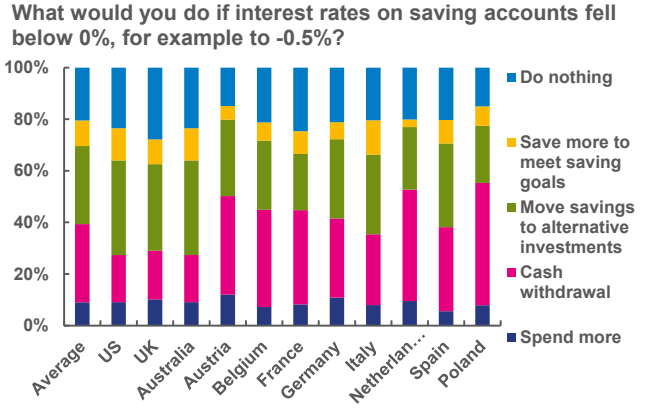
In Europe, our view is that banks will eventually pass on negative rates to their clients as NIRP settles and a number of obstacles are removed (see below). **Such tiered systems are here to smooth the transition, not to allow banks to block the transmission of monetary policy.** Japan however offers an alternative model where the central bank aims at shielding banks from negative rates and focusses on transmission channels from financial markets[8]. Overall, uncertainty is high at the microeconomic level about how banks will adapt and react to negative rates.

Running for cash

The dilemma on banks comes down to the question of how large cash withdrawals are to be expected from negative interest rates on deposit accounts. So far, **historical experience does not suggest large switches to paper currency, neither for corporate deposits nor large retail deposits.** In Denmark and Switzerland, negative rates on some deposit accounts have not led to any meaningful withdrawals[9], while the number and average value of notes in circulation kept decreasing in Sweden in 2015[10]. Some point out that cash holding is significantly higher in Germany and Japan, but this seems to be more of a cultural, long-term habit of using cash in transactions. A recent survey suggests however that a large share of consumers would withdraw cash in the event of negative rates (*Exhibit 3*)[11].

Exhibit 3

Large proportion of households ready to withdraw cash



Source: ING International Survey and AXA IM Research

One could argue that the preference for cash would only come through over time as economic agents realise the persistent taxation of deposits. **Given the uncertainty and dispersion of the ELB across economic agents, we can only acknowledge that the magnitude of this risk is unknown.**

Policymakers can aim at increasing the cost of holding physical currency, by for example abolishing large bills, an option currently being considered in the euro area for €500 notes. But the financial sector may at the same time come up with innovation to make the handling of physical cash easier, pushing down its cost. The balance of both over time only adds to uncertainty.

Race to the bottom

An important channel of transmission of negative rates to the economy appears to be the currency. Lower interest rates in money markets reduce the relative carry of the domestic currency compared to others, bringing it down.

The currency has taken a crucial role in monetary policy as central banks battle to maintain their credibility. Because the longer inflation stays below target, the more difficult it becomes to raise it, meaning

[7] See a discussion in Coeuré, B., Central banks and the challenges of the zero lower bound, Meeting on the financial crisis, 2012.
[8] See Alimi, M., "Negative rate, the Japanese way", AXA IM Research, 2 March 2016.
[9] See in the case of Denmark, Jensen, C. and Spange, M., Interest rate pass-through and the demand for cash at negative interest rates, Danmarks Nationalbank Monetary Review, second quarter 2015.
[10] Riksbank's statistics on banknotes in circulation.
[11] See Cliffe, M., Negative rates, negative reactions, VOXeu, February 2016.

speed has become a major dimension of monetary policy. Currency depreciations being the quickest way to bring about inflation, pushing the currency down is now an important tool.

Traditionally, rate cuts depreciate the currency but also boost domestic demand, such that the overall effect on trading partners is neutral or positive. **With the lower effectiveness of negative interest rates (as well as QE for that matter) to stimulate demand, risks of beggar-thy-neighbour policies have increased dramatically**, leading some observers to warn about 'currency wars'.

One does not have to put faith in deliberate currency wars to acknowledge that uncoordinated monetary policies deliver a similar outcome. The case for more coordination at the monetary policy level is in general not clear-cut, except in crisis circumstances[12]. Recent academic research focussing on the spreading of liquidity traps across economies also concludes that monetary policy has limited tools to avoid contagion, while fiscal easing and the production of safe assets are the best options[13]. It appears then, somewhat counter-intuitively, that the best way to avoid currency wars is fiscal policy.

Taxing cash: social implications and operational hurdles

As impure NIRP implies a number of drawbacks, most advocates of such a policy recommend pure NIRP and taxing cash, so as to remove the incentive to hold physical currency instead of electronic currency.

An extreme version would be to abolish cash altogether, an option that has merits but also drawbacks[14]. In any case, most students of NIRP agree that phasing out paper currency is not a necessary condition. There are several ways to tax cash, although the most flexible seems to be to end the fixed interest rate between paper currency and electronic currency *via* a crawling peg set by the central bank[15]. Even though the idea of having paper money below par (to the electronic – reference – currency) might shock, **this change would be similar to the abolition of the gold standard**. In a sense, paper money would then be in **a similar situation as "dirty money"** which is currently (criminally) exchanged for classic money at a discount.

NIRP may inspire a number of financial innovations to circumvent the tax on cash. These include new financial institutions or the accelerated emergence of alternatives such as Bitcoin.

Technical suggestions have been made to respond to operational hurdles (for retail shops and banks but also for handling reversed cash flows between creditors and debtors) but the main obstacle could well be political. People usually assume that cash in hand is a perfect store of wealth; **taxing savings in such a visible way could be seen as yet another gift to the banking system and might trigger exasperated reactions**.

'Time is money' no more

Bringing the founding principle of finance upside down may have a number of additional side effects. But most of them have to do with a *prolonged* episode of ultra-low or negative rates[16]. In our view, these do not weaken the case for NIRP *per se* but rather call for a short, aggressive response from central banks, as opposed to gradualism.

These side-effects include:

- Potential disruptions to economic activity, capital misallocations and idle cash;
- Distortions of asset prices and financial bubbles;
- Disincentive for governments to reduce debt and restore fiscal sustainability;
- Distributional effects as monetary policy taxes savers and rewards borrowers;
- Financial instability and financial repression as long-term institutional investors such as pension funds and insurance companies burden the cost of negative rates before ultimately passing them to pensioners and policyholders.

The future is bright

Overall, negative interest rates present a number of benefits and appreciable flexibility as an unconventional monetary policy tool. Two major hurdles appear, however: the limited impact of NIRP without taxing physical currency and the political reaction of the public to such a policy. Still, in a world of permanently lower interest rates where the zero bound is hit more often, negative interest rates look set to have a future as a viable policy option.

[12] See a discussion in Coeuré, B., The global and European aspects of policy coordination, Global Research Forum on International Macroeconomics and Finance, 2014.
[13] Caballero, R. et al., On the global ZLB economy, VOXeu, November 2015.
[14] See Rogoff, K., Costs and benefits to phasing out paper currency, NBER, 2012.
[15] See Agarwal, R. & Kimball, M., Breaking through the zero lower bound, IMF Working Paper 224, 2015.
[16] See Hannoun, H., Ultra-low or negative interest rates : what they mean for financial stability and growth, BIS, April 2015.

Box B: AXA IM market experts on negative rates

QE should be used to finance more government spending

Chris IGGO, CIO Fixed Income, AXA IM

In a world where debt levels remain extremely high, we do not have enough aggregate demand (nominal) growth to reduce debt ratios. The policy response has been to lower real rates below real growth in the hope that this will deliver the aggregate demand increases that reduce debt ratios. But I think the most attractive option for boosting aggregate demand is to leave the policy rate unchanged and lift the equilibrium rate by increasing debt-funded government spending. In practical terms, a QE-financed increase in government spending could be achieved through the creation of government liabilities held by the central bank in exchange for increasing monetary reserves. Multiplier effects would come from the fiscal spending but the central bank would also retain the option to reverse its holdings of government debt to the market periodically to satisfy the demand for long duration assets and ensure that the accrued benefits of increased investment in the economy are distributed to pensioners. Negative rates on the other hand have negative side effects, even if they don't dislodge the economic logic (impact on banks, income to savers, shifting demand for holding cash relative to bank accounts, political risk issues if policy took steps to eradicate or limit the distribution of cash in order to more effectively "tax" deposits).

Are falling prices such a bad thing? Negative yields offer opportunities

Mark TINKER, Head of AXA Framlington Asia, AXA IM

If prices are falling due to an excess supply relative to demand, then how is more liquidity going to help? Central banks do not create credit, but liquidity and (surely) part of their remit is to closely monitor how that liquidity gets turned into credit – if at all. If the only credit created is within the financial markets themselves then there is a clear risk that the cure is making the patient worse.

Currently, monetary policies are driving long-term investors into property, even as rental yields are falling, simply because there are no other 'safe' yields available. What if policymakers come to question the certainty that falling prices are a bad thing? The unleveraged consumer (the young renter) or corporate sees no threat from deflation and indeed is reluctant to take on any debt; the saver even more so.

Now that we are effectively admitting that bonds serve no purpose for savers, why not issue huge amounts of negative yielding bonds and redeem all the positive yielding ones? The current interest payments on public debt could then be re-allocated to a fiscal stimulus. More sensibly perhaps, why not issue zero-coupon perpetual bonds and have the central bank simply buy them all? Semi-public hypothecated infrastructure bonds could also be issued, but with turnover taxes or other limitations to stop them simply becoming tradable instruments.

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