



Department of **Economics and Finance**

Course of **Money and Banking**

*"Life Below Zero: The Impact of Negative  
Interest Rates on the European Banking Sector"*

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## Introduction

In the last decade, negative nominal interest rates have been implemented by many Central Banks across the globe, including the European Central Bank (ECB). This was done in the attempt of reviving economies which were caught in the aftermath of a balance sheet recession, notably the 2008 global financial crisis, and to ward off the consequent fear of a deflationary spiral.

In this work, we discuss the intended and unintended effects of the ECB unconventional policy of negative rates (NIRP). In particular, we focus on the impact which NIRP had on the European banking sector and on the traditional interest-driven banking model.

In the first chapter, we begin with a brief history of negative rates, discussing the difference between negative interest rates in real and nominal terms – and when central banks usually recur to each one of them. We then discuss the transmission channels through which negative rates are transferred to the economy. We conclude the first chapter with an initial assessment of the principal benefits of going negative in the ECB experience – we show that the two ECB's objectives, namely the intervention on the long-term end of the yield curve and the increase in banking rate, were accomplished – and we discuss some accidental effects which may arise should negative rates be adopted over a prolonged period.

In the second chapter we get to the core of the analysis, and we study the impact of a NIRP on European banks. We find that such impact depends also on the bank's size (measured by banks' total assets<sup>1</sup>) and business model. Indeed, we show that large banks with diversified stream of income are able to withstand such pressure, while small deposit-dependent banks tend to suffer more in such environment. We then also discover that a cut to negative rates can be considered "special", as it encompasses a stronger effect in terms of stability than a cut to non-negative levels.

Then, we observe how banks reacted to such policy and how they adjusted to the new environment. We look at data concerning bank profitability in Europe, and we show that the adverse effects from reduced interest

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<sup>1</sup> Working Paper Series, "Do negative interest rates make banks less safe?", pp.7

margins and the tax on excess reserves were compensated to a large extent by other factors, such as a drop in loan-loss provisions.

We then turn to the study of the alternative options available to banks to increase their depressed profit margins.

Afterwards, we also discuss whether the impact of the ECB' NIRP depends on the banks' country of residence. We find that Southern European countries have even benefited in net terms from ECB's policies enacted to ease the negative effects of NIRP – in particular Italy and Spain, with a positive balance of 1.6 and 1 bln of euro each – while Northern countries display negative balances – Dutch banks (-342 mln), French banks (-412 mln) and above all German banks (more than a billion euros of losses).

We also present two case studies about a couple of Italian banks (*FinecoBank* and *UniCredit*) which have started to indirectly pass-through – in the case of *UniCredit* even directly – negative policy rates to their customers.

We conclude our analysis of how the traditional interest-driven banks' business model was affected by a NIRP, by discussing the future challenges which banks need to face if such policy is protracted over time.

Therefore, the main conclusions emerging from this research are as follows. In the first chapter, which was dedicated to the analysis of the NIRP's mechanisms, we have confirmed that negative rates had a greater impact along the yield curve than a standard rate cut. In the second chapter, where we discussed the impact that such policy has had on the European banking sector, we reached several conclusions. First, we confirmed that the impact of a NIRP on banks does depend on their business model. In particular, small banks which rely more on deposit funding are perceived as riskier than large credit institutions with diversified income. Then, we also verified that a cut to negative rates can be considered "special", as it yields a stronger impact on financial stability than conventional cuts to positive rates. We then analyzed the effects of the extra pressure exerted by negative rates on bank profitability. The results showed that banks risk-taking activities have increased, with a consequent abnormal demand for high-yielding risky assets.

Finally, we also confirmed that bank profitability is affected by their country of residence. Indeed, credit institutions in European

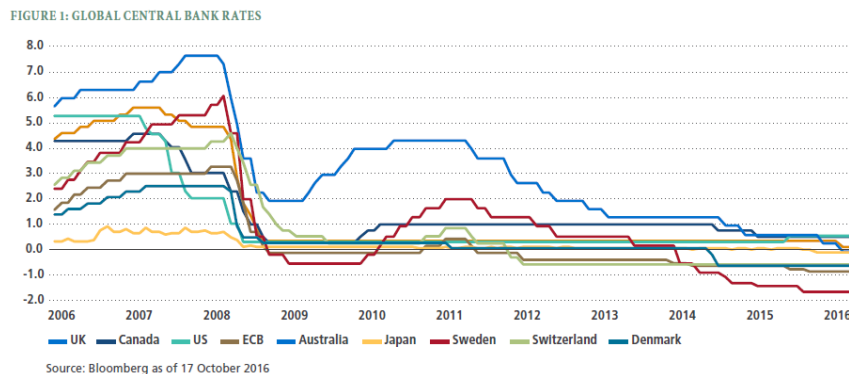
Southern countries even benefited in net terms from NIRP, while bank profitability in Northern countries dove, as banks there took the major hit of the ECB accommodative policy.

## Chapter I. Introduction to negative nominal interest rates

In the past decade, Central Banks in Europe, Japan and Scandinavia have all implemented a negative interest rate policy (NIRP), imposing negative rates on the excess reserves that banks had deposited at the Central Bank. This unconventional tool was adopted as part of the monetary policy in response to the global financial crisis which formally broke out in US in September 2008 and rapidly spread to the rest of the world, erupting in May 2010 in the Euro area.

Specifically, the idea of going negative was first implemented on the 2<sup>nd</sup> of July 2009 by the Sweden's Riksbank, which cut its overnight deposit rate to -0,25%. The same strategy was then pursued by the ECB on the 24<sup>th</sup> of June 2014 – when the deposit facility rate (DFR) was lowered to -0,10%<sup>2</sup> – and by the Bank of Japan in 2016 – when they reduced their short-term rates to -0,10%. In December 2014, the Swiss National Bank (SNB) introduced a negative interest rate policy as well, cutting its key rate at -0,75%<sup>3</sup>. The figure below plots the interest policy rates set by several central banks.

Figure 1. Global Central Bank Rates



Source: Pimco<sup>4</sup>

The main common factor which led these three central banks to make such a bold move was the need of stimulating the economy and counter

<sup>2</sup> As of now (20 April 2021) the ECB's DFR is -0,50%. See [https://www.ecb.europa.eu/stats/policy\\_and\\_exchange\\_rates/key\\_ecb\\_interest\\_rates/html/index.en.html](https://www.ecb.europa.eu/stats/policy_and_exchange_rates/key_ecb_interest_rates/html/index.en.html).

<sup>3</sup> See De Montpellier C. (25 March 2021), "Swiss National Bank: Negative rates for years to come" in ING, <https://think.ing.com/articles/swiss-national-bank-negative-rates-for-years-to-come>.

<sup>4</sup> Pimco, December 2016, "Investing in a negative interest rate world", <https://japan.pimco.com/en-jp/resources/education/investing-in-a-negative-interest-rate-world>.

deflationary pressures, after the 2008 crisis broke and conventional policy was exhausted.

In particular, in the euro zone, the Maastricht Treaty of 1992 states that the ECB has a single mandate, which is to maintain price stability. Therefore, the attempt to increase inflation's expectation in Europe represents one reason why the ECB decided to pursue an aggressive measure such as NIRP<sup>5</sup>: they were bounded by the inflation target level, which has been set below but close to 2% for the medium run. Indeed, by incentivizing banks to lend more to the public – rather than accumulating money in ECB deposits – the ECB aimed at increasing the circulation of money throughout the economy, hence warding off the threat of deflation, which could have followed the economy's recession as it did in past crises.

However, negative policy rates were not the first measure adopted by the ECB.

Indeed, at first ECB's conventional response was to cut its rates and to enhance its credit support to European banks, as such institutions play a crucial role in credit intermediation. In essence, ECB resorted to forward guidance as a mean to offer further accommodation, providing banks with ample liquidity for a much longer period than it would have under a standard operation.

However, despite these efforts, in mid-2014 the downside risks to the inflation outlook intensified and additional accommodation was required. Policymakers were afraid that Europe was on the verge of a deflationary spiral, with tremendous consequences on the European and world economy. Indeed, in harsh economic conditions, consumers and corporations lose confidence in the economy's health and lower their expectations for its future outlook. Therefore, they choose to hoard their cash while waiting for the situation to improve. However, this lack of spending can only weaken the economy further, as it leads to jobs' losses, lower profits and consequently prices to drop even more – with the reverse effect of giving people an extra incentive to hold on to their cash.

Consequently, the need to prevent the realization of such scenario was one of the main drivers of the ECB's decision – as well as other

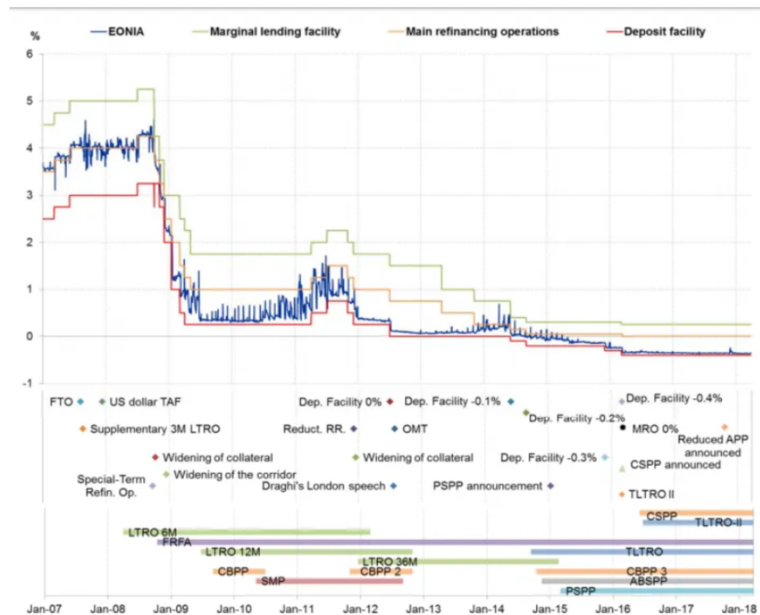
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<sup>5</sup> Benoît Cœuré, Member of the Executive Board of the ECB, 9 September 2014, "Life below zero: Learning about negative interest rates", Presentation at the annual dinner of the ECB's Money Market Contact Group, Frankfurt am Main.



central banks' – to cut its interest rates on excess bank reserves to negative levels. The graph below presents the key ECB interest rates. As it can be seen, the deposit facility rate (DFR) is currently set at a negative level of -0.50%.

Figure 2. Interbank lending, EONIA and bank profitability



Source: ECB<sup>6</sup>

This policy would hopefully encourage banks to use their reserves as a basis to lend more to the public, and thus gain profits, rather than losing money on excess reserves parked at the ECB. Additional bank loans, in turn, should lead to higher spending in the economy, and in this way counter deflationary pressures.

As low or negative yields on European debt represent a great deterrent for foreign investors who are willing to invest in a country, another important effect of a NIRP is the weakening of the demand for the euro currency. Indeed, a weaker euro should stimulate demand for export – given the increased competitiveness of European firms on international markets – leading to a business expansion.

In this first chapter, we closely examine how negative interest rates work – sub-sections 1.1 and 1.2 –, how their effects are transmitted to the economy (the five transmission's channel) – sub-section 1.3 –

<sup>6</sup> Bocconi Students Investment Club (22 September 2019), "Tiering to avoid tearing balance sheets: Understanding the ECB new policy", <https://bsic.it/tiering-to-avoid-tearing-balance-sheets-understanding-the-ecb-new-policy/>

and which are the main benefits (sub-section 1.4) and risks (sub-section 1.5) of a NIRP.

### **1.1. Negative interest rates in real terms and the zero-lower bound**

Interest rates can be negative both in real terms ( $r < 0$ ) and in nominal term ( $i < 0$ ).

As the real interest rate can be found by subtracting the inflation rate from the nominal interest rate<sup>7</sup>, negative rates in real terms only occur when inflation exceeds the nominal rate ( $\pi > i$ ). Regarding their effects on the economy, they result in a drop in the real cost of borrowing, since borrower's total repayments have less purchasing power than the amount they first borrowed.

Negative real rates have been adopted on several occasions by different countries, both developed and developing ones. For example – if we now consider negative real rates for government's bonds and other sovereign-debt-related securities – in the late 1940s through the early 1970s, the UK and US government were able to reduce their debt burden by nearly 30% of GDP per decade by keeping real interest rates low and below growth rates<sup>8</sup>. Indeed, low – or even negative – interest rates in real terms imply a lower real cost of borrowing, something which is positive for debtors – in the case above the US and UK governments – and painful for creditors. Negative real rates also occur in connection with financial repression, that is when government impose specific portfolio restrictions and regulations on investors and banks. For this reason, economists also relate to such conditions as captive market, as restrictions and control exercised by the government force investors to place their money in assets which yield a negative return in real terms.

In recent years, however, the idea of negative rates has been associated with nominal, rather than real, interest rates.

Indeed, the zero-lower bound, which had long stated that nominal rates could not fall below a level of zero, has been breached.

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<sup>7</sup> Approximation of Fisher equation,  $r = i - \pi$ , where  $\pi$  stands for inflation.

<sup>8</sup> Carmen M. Reinhart and M. Belen Sbrancia (March 2011) "The liquidation of Government Debt" National Bureau of Economic Research working paper No. 16893.

Before negative nominal interest rates, there was the common belief that if the lower bound was reached, and the economy was still underperforming, then the central bank could no longer provide stimulus via monetary policy. In such situation, indeed, other measures should be adopted in the attempt to stimulate the economy, such as the implementation of an expansive fiscal policy by the government.

This scenario was famously referred to by the British economist John Maynard Keynes as a liquidity trap, indicating a situation where almost everyone prefers cash to holding a debt with zero-return, leaving monetary authority with little control over the economic activity.

Nevertheless, sometimes exceptional circumstances require unprecedented measures. Indeed, during the deep economic recession which followed the global financial crisis, even though monetary efforts and market forces had already pushed interest rate to their nominal zero bound in most countries, the situation was still deteriorating. In Europe, despite an ultra-low DFR (0,00% both in 2012 and 2013), inflation levels monitored by the European Central Bank CPI registered a drop of nearly 90% from an inflation rate of 3,34% in 2008 to 0,32% in 2009. Inflation remained relatively low in the following years, risking several times to fall into negative territory ( $\pi_{2015} = 0,03\%$ ,  $\pi_{2016} = 0,24\%$ )<sup>9</sup>.

It was in this scenario, that on the 24<sup>th</sup> of June 2014 the ECB chose to pursue an unprecedented and aggressive policy of negative nominal interest rates, cutting the deposit facility rate to -0,10% (now it has been reduced further to -0,50%). Indeed, as the former ECB chief Mario Draghi said, in a context of «protracted» weakness, the NIRP was the only measure to successfully deal with the consequences of the global financial crisis.<sup>10</sup>

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<sup>9</sup> See Webster Ian (6 May. 2021), "Inflation Rate in 2007 | Euro Inflation Calculator" in Official Inflation Data, Alioth Finance, <https://www.officialdata.org/Euro-inflation-rate-in-2007>.

<sup>10</sup> See Reuters Staff (13 September 2019), "Explainer: how does negative interest rates policy work?" in U.S Market, Reuters, <https://www.reuters.com/article/us-ecb-policy-rates-explainer-idUSKCN1VY1D2>.

## 1.2. How negative nominal interest rates work

Interest rates are often considered to be the price of borrowed money. For this reason, when it comes to negative rates, things get odd, as there is no good carrying a negative price.

Let's consider an example to clarify the situation. Commercial bank A – the lender – stores an amount of €100.000 excess reserves on its deposits at the ECB – the borrower – at time 0, say April 2021. Let's suppose that the ECB sets an annualized deposit facility rate of -0,50%. This means that after one year, in April 2022, when the interests are accrued on the excess reserves of bank A, these will be worth  $€100.000 (1 - 0,50\%) = €99.500$ , which is €500 less than the original amount. This simple example shows that in a negative rates environment, borrowers are credited interest rather than paying them to lenders.

Therefore, this non-traditional monetary tool will hopefully boost, spending, borrowings, and investments rather than hoarding cash, whose value would only be decreased due to negative deposit rates.

Nonetheless, it remains to be seen why banks should be willing to deposit their excess reserves with the central bank if they know they're going to lose money on it. The answer lies in the fact that alternatives to depositing reserves are also costly. Indeed, it's the cost of finding valid substitutes to central bank deposits which ultimately determines how far in negative territory the DFR can go. Regarding these alternative options, commercial banks can always resort to physical currency instead of holding electronic money in their accounts with ECB. Since a potential lender could always choose not to lend and just sit on the funds, yielding a zero-nominal rate of return, the idea of the zero lower bound is here verified.

However, storing, holding, and using physical currencies is costly. In fact, banks would bear the costs stemming from the storing facilities, as well as the expenses related to the shipment of the currencies. A recent ECB study found out that on average the approximate private cost of cash payments is 1,1% of GDP, while the unit social costs was estimated at 2,3 cents per euro of

transactions<sup>11</sup>. If we apply these costs to the volume of transactions on the money market alone, costs for commercial banks would skyrocket.

### **1.3. NIRP's transmission channels**

Any assessment of the negative interest rate policy should include one central question: whether negative nominal rates translate into superior growth rates.

In short, the monetary incentive provided by this unconventional tool aims to raise short-term growth through five key transmission channels: by enhancing credit to the real economy (the credit channel), by boosting asset prices (the asset valuation channel), by forcing investors away from safe assets into riskier ones (the portfolio balance and risk-taking channels), by lowering the exchange rate (the exchange rate channel) and by fostering the inflation rate, warding off the possibility of a deflationary spiral (the reflation channel).

Let's now go through each one of them.

#### **1.3.1. The credit channel**

Under a negative interest rate environment, banks are faced with a difficult choice. They no longer find profitable to deposit their excess reserves at the ECB, as negative rates erode the value of such deposits. Therefore, they tend to opt for some alternative ways to invest their excess reserves, mostly on financial markets. First of all, banks might purchase governments' bonds with their excess reserves. This phenomenon – which represents an unintended effect of the ECB NIRP – has contributed to lowering the yields on government's debt securities. Second – especially if governments' bonds yields are very low, as it is right now – banks have started to use their excess reserves to purchase corporate bonds. Lastly, they might lend directly – in the real economy – to firms and households (without the intermediation of financial markets).

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<sup>11</sup> Schmiedel H., Kostova G., and W. Ruttenberg, 2012. "The social and private costs of retail payment instruments. A European perspective", ECB Occasional Papers Series, No. 137.

Considering such credit circuit – often referred to as bank lending channel – which starts with the ECB lending money to commercial banks and ends up with banks lending out money (in the three ways we have just described), we need to place our discussion of the transmission of negative rates through the credit channel. Indeed, the main target of a NIRP is to deter savings and encourage borrowing. This is accomplished by central banks by cutting down the costs of financing – de facto imposing a sort of tax on commercial banks' deposits of excess reserves. In this regard, banks have two choices: they either pass on the tax's burden to their customers – by charging negative rates on retail deposits – or they can supplement the extra cost due to this tax via other means – such as increasing the fees they collect from their customers. In the second chapter, we are going to examine carefully each one of these options.

### **1.3.2. The asset valuation channel**

Another transmission channel through which negative interest rates should improve growth rates and stave off deflation is through asset prices. Indeed, extremely low rates increase asset prices by reducing the discount rate on cash flows from assets (i.e., dividends). Additionally, an expansionary monetary policy, such as NIRP, strengthens the expectations of an improvement in the economic outlook, thus raising future assets' yields.

Regarding the impact of negative rates on stock markets, Md. Mahmudul Alam, and Md. Gazi Salah Uddin try to answer such question. According to the evidence they collected, in each of the countries considered, interest policy rates seem to have a significant negative relationship with assets' share price<sup>12</sup>. The figure below represents graphically such negative relationship.

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<sup>12</sup> Alam, M.M., and Uddin, M.G.S. 2009. Relationship between Interest Rate and Stock Price: Empirical Evidence from Developed and Developing Countries, *International Journal of Business and Management*, Vol. 4(3), pp. 43-51, <http://www.ccsenet.org/journal/index.php/ijbm/article/download/217/177>.

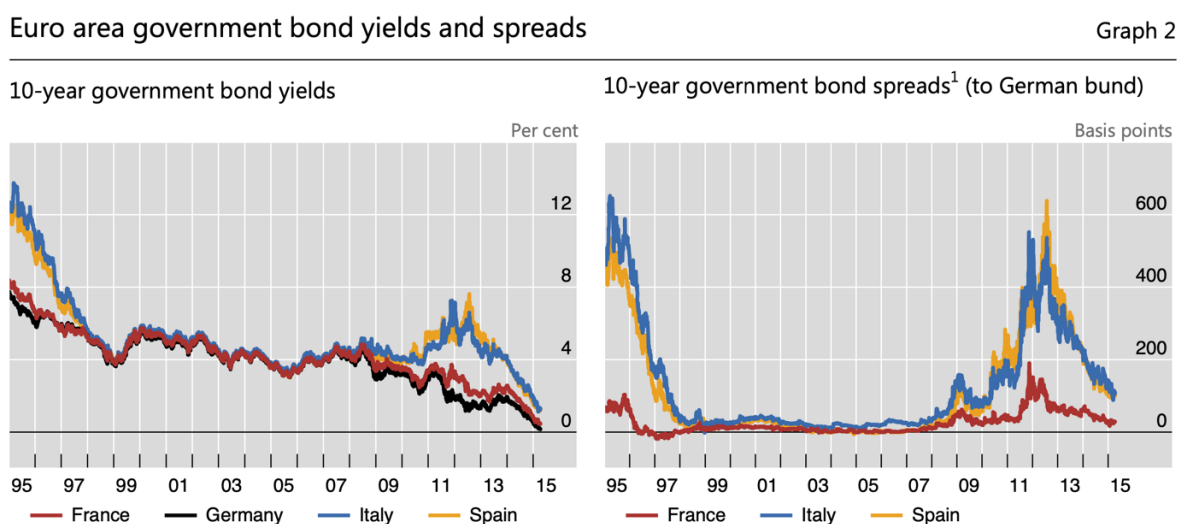


However, as the exuberance generated by this phenomenon is temporary, this transmission channel operates only in the short-term.

### 1.3.3. The portfolio balance and risk-taking channels

The portfolio balance channel provides investors with an incentive to shift out of government bonds and into riskier assets. Indeed, negative interest rates trigger a search for yield, which in turn fuels a more risk-taking behaviour, resulting into a convergence between the returns of assets with a low risk profile and those of risky assets – as we currently observe in the sovereign credit spreads of the euro zone. Such convergence of the European government bond yields and spreads is confirmed by the two graphs below<sup>14</sup>.

Figure 5. Euro Government Bond Yields and Spreads



<sup>1</sup> Spread vis-à-vis 10-year German government bond yield.

Source: Bloomberg; BIS calculations.

Source: Bank for International Settlements, Hervé Hannoun (22 Apr. 2015)

This situation, where euro zone's sovereign risks are deemed by many to be mispriced, is also aggravated by the European Commission's policy of applying the same zero risk weight to all sovereign debts, irrespectively of credit quality.

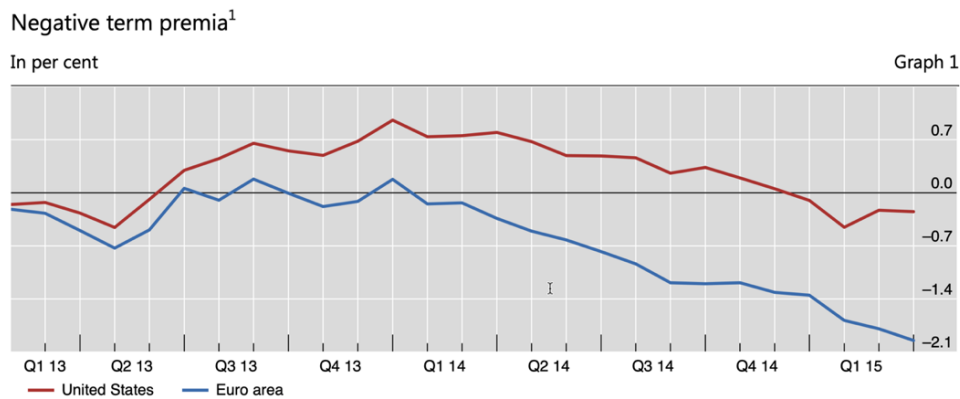
Another major effect of investors' search for yield is the quest for duration, which eventually resulted in negative term premiums – which supposedly should reward investors for holding bonds with long

<sup>14</sup> Note that as of today (June 2021), some of the 10-year government bond yields are even negative. For example, the yield on the Germany Bund 10 Year Yield is -0.202%.



maturities. In the figure below, interest premia for the euro area and for the United States are plotted and it can be seen how they both turn negative at certain points.

Figure 6. Negative term premia



<sup>1</sup> Decomposition of the 10-year nominal yield according to a joint macroeconomic and term structure model; for the euro area, using French government bond data. See P Hördahl and O Tristani, "Inflation risk premia in the euro area and the United States", *International Journal of Central Banking*, September 2014.

Sources: Bloomberg; BIS calculations.

Source: Bank for International Settlements, Hervé Hannoun (22 Apr. 2015)

Indeed, in the absence of profitable opportunities at the short and medium end of the euro zone sovereign yield curves, savers are investing their money in long-dated assets with extremely low yields. This side-effect of NIRP is very dangerous, as an eventual normalisation of long-term yields would significantly lower investors' wealth – as the  $i$  goes up, the price falls and so does investors' portfolio value.

#### 1.3.4. The reflation channel

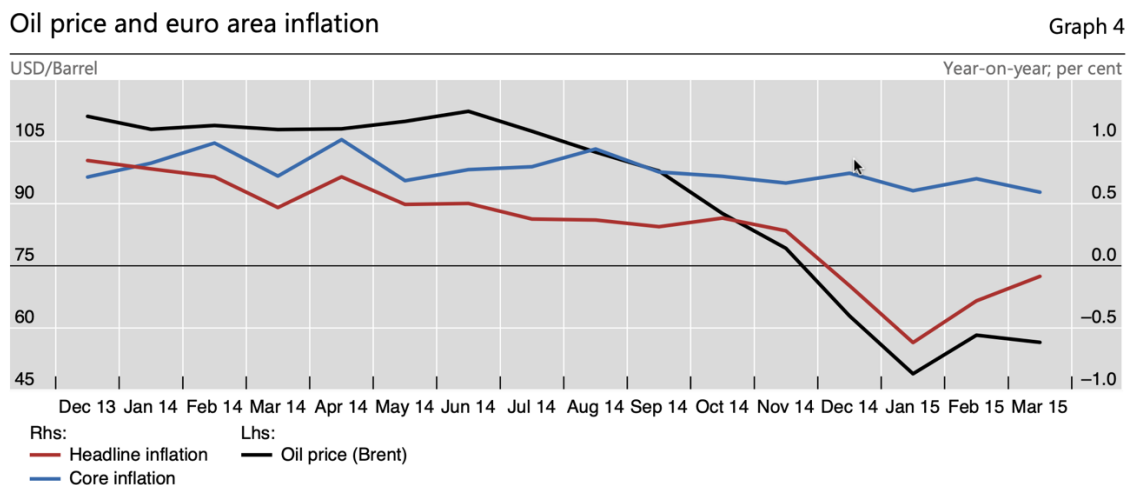
Central banks aim at lifting inflation towards a fixed target – in EU it is around 2% – as a means to dismiss the risk of debt deflation. This fear was fuelled by signs of a strong disinflation driven by falling oil prices, both in 2014 and 2015<sup>15</sup>. Indeed, the euro zone's annual core inflation rate<sup>16</sup> measured +0,7% in December 2013 – right before the ECB cut its DFR to negative levels in June 2014 – and +0,6% in March 2015, as it is reported in the two graphs below. To this

<sup>15</sup> The price of oil (Brent) surged from \$11/barrel in 1999 to a peak of \$145,6/barrel in July 2008, just before declining to a level of \$34,6/barrel in 2008. The price rose again to \$115,5/barrel in 2014 and remained below \$62/barrel during 2015.

<sup>16</sup> The annual core inflation rate is computed as the headline inflation minus energy, food, tobacco, and alcohol.

extent, figure no.7 plots the Oil price (Brent) against core inflation and headline inflation level, while figure no.8 displays Consumer Price Inflation for the Euro Area and for the United States – HICP for the Euro Area and CPI-U for the US.

Figure 7. Oil price and euro area inflation



Sources: Bloomberg; Datastream; BIS; BIS calculations.

Source: Bank for International Settlements, Hervé Hannoun (22 Apr. 2015)

Figure 8. Consumer Price Inflation

### Consumer price inflation<sup>1</sup>

In per cent

Table 1

	Year-on-year		Month-on-month (seasonally adjusted)	
	Euro area	United States	Euro area	United States
Sep 2014	0.3	1.7	0.0	0.1
Oct 2014	0.4	1.7	-0.1	0.1
Nov 2014	0.3	1.3	-0.1	-0.3
Dec 2014	-0.2	0.8	-0.3	-0.3
Jan 2015	-0.6	-0.1	-0.3	-0.7
Feb 2015	-0.3	0.0	0.3	0.2
Mar 2015	-0.1	-0.1	0.2	0.2

<sup>1</sup> For the Euro area, HICP; for the United States, CPI-U.

Sources: National data.

Source: National Data (HICP for the Euro Area and CPI-U for the US)

### 1.3.5. The exchange rate channel

Exchange rates represent the last transmission channel of a NIRP. As low or negative yields on European Governments' debts will deter foreign investors, the weakening of the demand for the euro currency

would follow. Indeed, low expected returns on investments lead investors to transfer their capitals to other countries where asset yields are higher, hence lowering the currency exchange rate.

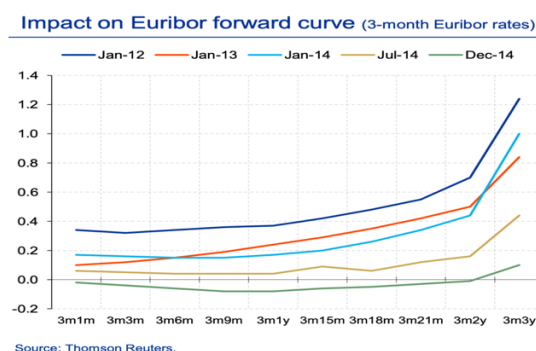
The depreciation of a currency also encourages net exports – hence growth and employment in the economy – while raising inflation’s expectations through higher import prices. However, not all countries are able to easily depreciate their currencies, especially not at the same time. Indeed, if they all tried to depreciate simultaneously, the result would be a currency war, in the form of a competitive monetary easing – a zero-sum game.

#### 1.4. The principal benefits of going negative: the ECB’s experience

Let’s now briefly discuss the main upsides of a NIRP in the euro area by looking at the key events which followed its introduction by the ECB in June 2014.

Right after the DFR was cut to negative levels, the lower interest rates were smoothly transmitted to the money market, and market uncertainty about the future path of policy rates dropped. Indeed, EONIA forward curves flattered and shifted down, and the volatility of EONIA rates plunged. Likewise, the entire 3-month Euribor forward curve shifted down, eventually trading even in negative territory, as it is indicated by the graph below.

Figure 9. 3-month Euribor forward curve



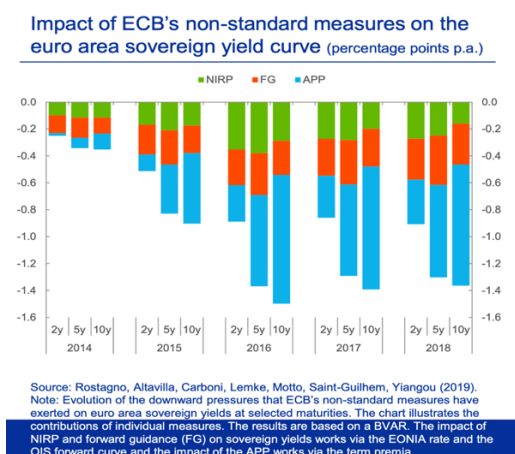
Source: ECB

Most importantly, the fact that money market trading volumes did not fall – but actually rose<sup>17</sup> – is a strong signal that a large segment of unsecured money market trades can occur at negative rates without hampering market functioning. This was made possible thanks to a successful and synchronized response of market participants, who promptly adapted to the ECB’s decision.

Therefore, we can say that the ECB has succeeded in moving the perceived lower interest rates’ bound to negative levels, in line with its forward guidance. This reinstated a key element of monetary policy: the possibility for market participants to expect and anticipate further policy cuts in negative territory, thus frontloading and fostering ECB monetary accommodation. As a result, the zero lower bound is now not anymore perceived as a constraint in market expectations.

Furthermore, the effects of the NIRP were also transmitted to the long-term end of the yield curves and to market segments otherwise unreachable through conventional open market operations. The NIRP, through the portfolio balance and risk-taking channel, contributed to shifting euro sovereign yields downwards across the full maturity spectrum, as we can observe in the figure below.

Figure 10. Impact of ECB’ NIRP on European sovereign yield curve



Source: ECB

Indeed, as investors were incentivized to rebalance their portfolios towards longer-dated securities, a drop in the term premium followed.

<sup>17</sup> Working paper series, life below zero: bank lending under negative policy rates.

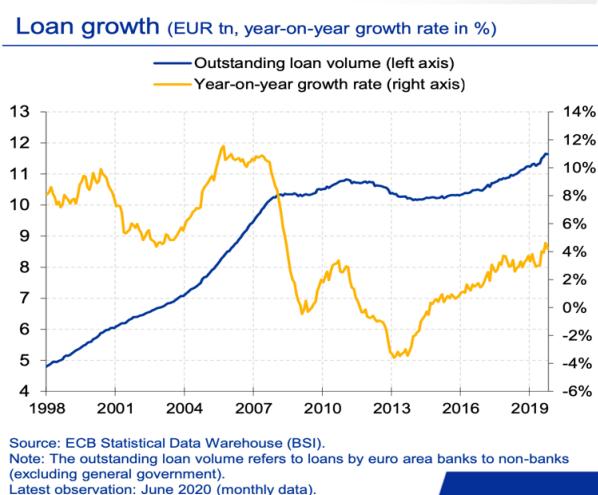
By the same token, NIRP reinforced the effect of the ECB asset purchase program: if banks lose money on deposited excess reserves, they are encouraged to reduce them by shifting into riskier assets, such as long-dated government bonds.

Eventually, it was clear that the effects of rate cuts to negative levels were significantly deeper along the yield curve than a standard rate cut, which would have had little impact on longer maturities.

Therefore, we can soundly assert that NIRP has served its first purpose: influencing the long-term end of the yield curve.

Regarding ECB's other objective, namely bank loans, NIRP led to an increase in bank lending rate. Indeed, this can be inferred from figure 11, which exhibits a significant increase in the outstanding loan volume by euro area banks to non-banks institutions.

*Figure 11. Bank lending rate*



*Source: ECB*

An ECB analysis confirms the view that NIRP had a positive causal impact on loan growth<sup>18</sup>. The analysis demonstrated that since the beginning of the NIRP in 2014, the number of loans extended to non-financial corporations (NFCs) is much higher than it would have been if other conventional tools had been adopted, as it suggested by the figure that follows<sup>19</sup>.

In conclusion, these two groups of finding – the strong pass-through from policy rates to market rates and the boom in lending rate –

<sup>18</sup> See ECB Economic Bulletin, Issue 03/2020.

<sup>19</sup> See appendix N.10

suggest that the negative interest rates' policy by ECB promoted monetary policy transmission among European countries.

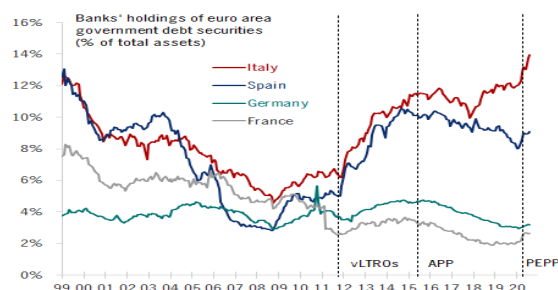
### 1.5. A long-term perspective: the accidental consequences of negative interest rates

Assuming a long-run perspective, negative interest rates bring about several unintended consequences which can be counterproductive for the economy's growth. These unintentional effects can be summarised as five main categories of risk: disincentive, distraction, distortion, disruption, and disillusion.<sup>20</sup>

#### 1.5.1. Disincentive to fiscal consolidation

There are several ways through which negative policy rates affect interest rates on governments' bonds. First, since the advent of negative policy rates banks have been looking for new profitable opportunities to invest their excess reserves in. Among the others, they have also started to buy governments' bonds, as it is represented by the graphs below. Indeed, figure 12 shows how banks' holdings of euro area government debt securities have changed in the last twenty years. The graph shows how countries in southern Europe have increased their debt level much more than then northern countries – we will see examine in detail such differences in subsection 2.4.1. On the same line we find figure 13, which plots the exposure of European banks to sovereign debt inside and outside Europe.

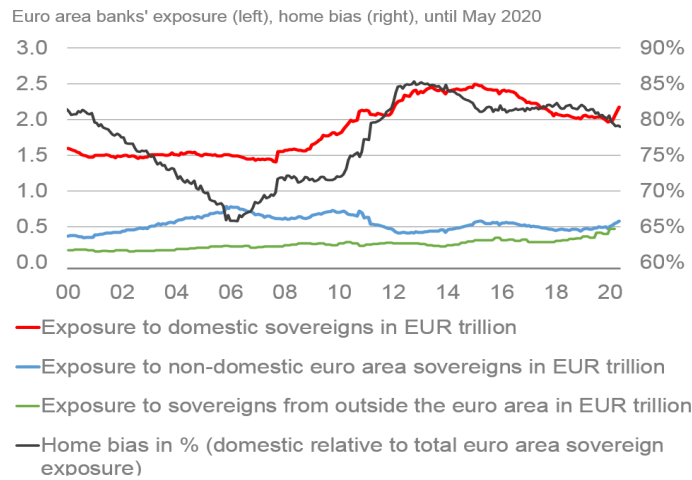
Figure 12. Banks' holdings of euro area government debt securities



Source: ECB

<sup>20</sup> See Hervé Hannoun, Deputy General Manager, 22 April 2015, Bank for International Settlements, "Ultra-low or negative interest rates: what they mean for financial stability and growth", speech at the Eurofi High-Level Seminar, Riga.

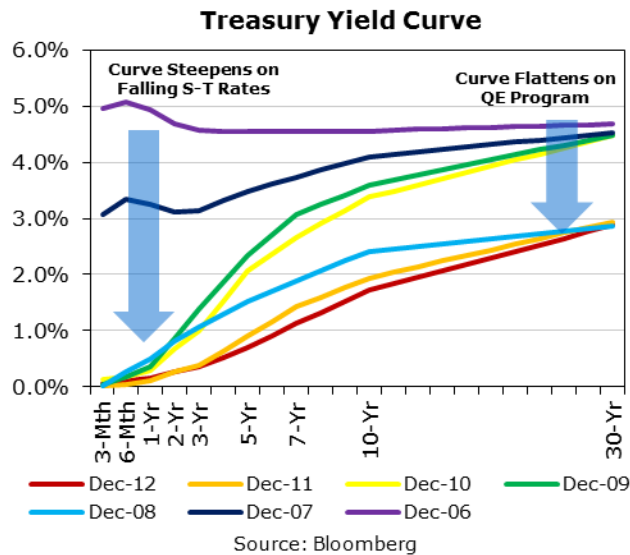
Figure 13. Euro banks' exposure



Source: Deutsche Bank

Another way through which negative rates influence interest rates on sovereign bonds is through other ECB measures complementary to NIRP. Specifically, asset purchase programs – such as the Quantitative Easing (QE) – have had a significant impact on returns on governments' debt-related securities. The QE program, consisting in the purchase of sovereign bonds by the ECB, allowed the ECB to flatter the long end of the sovereign yield curve, as the graphs below shows.

Figure 14. Treasury Yield Curve

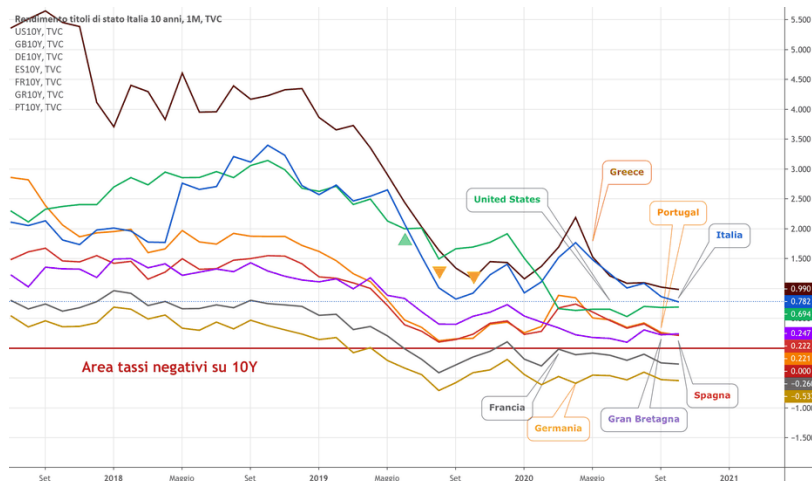


Source: Bloomberg

As a result, the yields on sovereign bonds across the world have collapsed over the last two decades, as the figure below indicates,

even reaching negative levels in countries with low credit risk (such as Germany).

Figure 15. Sovereign yields across countries



Source: TradingView

Given this, let's recall that the interest rate can be seen as the price of borrowed money in the economy. Therefore, ultra-low interest rates provide governments with no incentive to reduce their debt<sup>21</sup>, but rather encourage them to increase their borrowing. As a result, the debt-to-GDP ratio of European countries has risen on average from a level of 72,8% in 2007 to 108,4% in 2015 – now (April 2021) it is around 95,1% (see the two highlighted figures in the table below).

Figure 16. Government debt and interest payments

Government debt and interest payments

As a percentage of GDP

Table 2

	Government debt		Government net debt interest payments	
	2007	2015	2007	2015
Euro area <sup>1</sup>	72.8	108.4	2.5	2.2
Germany	63.9	75.8	2.4	1.0
France	75.6	117.4	2.5	1.9
Italy	111.8	149.2	4.5	4.4
Belgium	93.6	119.5	3.5	2.6
United States	64.3	110.1	2.6	2.6
Japan	162.4	233.8	0.0	1.1
United Kingdom	45.3	97.6	1.7	2.6
Canada	70.4	94.3	0.6	0.2

<sup>1</sup> The 15 countries in the euro area that are OECD members.

Sources: OECD; BIS calculations.

Source: OECD, BIS calculations

<sup>21</sup> Which is something that may help countries with high deflationary pressure or on in the midst of a recession but could be dangerous if prolonged in the long-run.



This deterrent to fiscal consolidation comprises two components. First, negative rates flatten the debt service ratio<sup>22</sup>, resulting in a false picture of debt sustainability. Consequently, governments tend to postpone indefinitely fiscal reforms, with troubling effects on fiscal discipline.

Second, negative interest rates and large-scale purchases of government debt securities led to an artificial compression of sovereign spreads and a disruption in the capability of market to correct themselves (i.e., market discipline). Indeed, the belief that central banks have unlimited powers – and can always intervene to the rescue of financial institutions and governments when debt overhang problems arise – pervades both governments and financial markets.

### **1.5.2. Distraction**

Every time financial markets obsessively focus on the monetary policy set by central banks, they tend to ignore the real challenges of economic policies: increasing productivity and real growth through structural reforms. Post-crisis, many economies are still struggling as they find themselves in the middle of a balance sheet recession. However, such conditions provide for monetary policy to be less effective, as it is unlikely that weak financial institutions are able to successfully increase lending and thus transmit the monetary stimulus. Therefore, in order to pull an economy out of a balance sheet recession, it is fundamental that the wealth of MFIs is restored, and structural reforms enacted. To this extent, monetary accommodation can only buy the time needed to implement such improvements, but it cannot substitute for them. Indeed, prolonged periods of ultra-low rates with no repair or reform going on, can lead to unintended and counterproductive effects. For example, excessive accommodation can make financial institutions believe that this period will last forever, thus they are left with no incentive to strengthen their financial solidity.

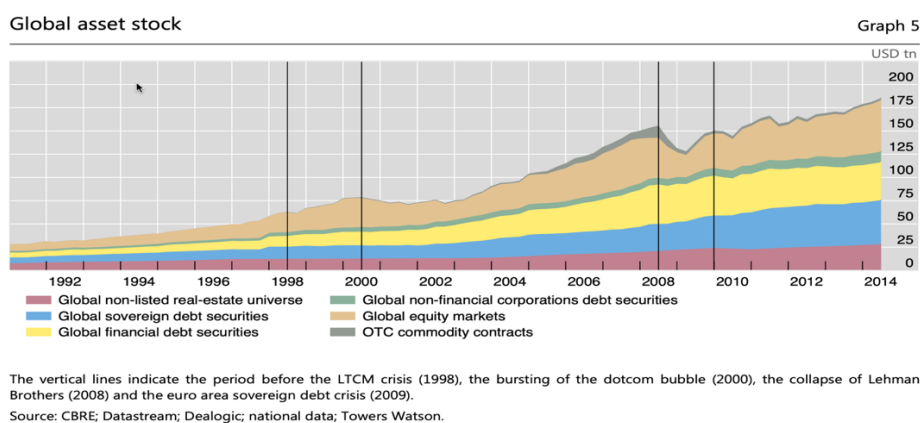
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<sup>22</sup> A country's debt service ratio represents the ratio of its debt service payments (corresponding to principal plus the interests) over the country's export earnings. Such ratio differs from the debt service coverage ratio, as the latter is computed by dividing a country's income by its debt.

### 1.5.3. Distortion

On the same line of the distraction effect, we find the distortion element. Indeed, when central banks' policies become the main driver for prices – whether for price we mean exchange rates, stock, commodities, or bond prices – in financial markets, asset prices become distorted (mainly overpriced). A surge in prices in several financial markets (stocks, fixed income, and commodities market), as the one we are observing since the enacting of monetary policy in the wake of the 2008 crisis (see the figure below), might be signalling the advent of this phenomenon.

Figure 17. Surge in asset prices



Source: Bank for International Settlements, Hervé Hannoun (22 Apr. 2015)

In such scenario, central banks replace economic fundamentals in setting market valuations.

As a result, there is the chance that bond prices do not longer fairly reflect the risk which results from record high debt levels. Likewise, securities' prices in the equity market are artificially inflated as investors are forced to buy riskier assets in order to generate positive returns.

As the wealth effect stemming from this element is mainly positive, one could argue that there is nothing to worry about. However, all this involves the risk of a major correction – with disastrous effects on investors' wealth – when confidence in inflated valuations is lost, or when central banks will withdraw their monetary stimulus.

#### 1.5.4. Disruption

The financial stability of an economy may be undermined by a prolonged period of negative interest rates, as they cause disruption in financial institutions' business models (banks, pension funds, insurance companies and money market funds).

NIRP launched deposit taking institutions into a new world in terms of balance sheet management, forcing them to either pass-through negative rates to their clients or absorb the full hit on their intermediation margins.

Indeed, if banks refuse to pass on negative rates to their customers, their profits stemming from maturity transformation<sup>23</sup> will shrink significantly. Some banks have even turned away large corporate customer deposits as they are not anymore able to find safe assets with positive return and that at the same time cover the costs of the service they offer to their clients.

Alternatively, where banks transmitted negative rates to their depositors, demand for physical currency (cash) surged<sup>24</sup>. Indeed, the combination of negative deposit rates and digital innovation could boost financial disintermediation, as people are encouraged to look for alternatives to store their money, i.e., virtual currencies.

Another example of disruption in the traditional business model of banks is represented by the effects of the NIRP on loan contracts linked to a benchmark floating rate. Indeed, if banks do not specify a zero-floor clause in the contract, they may face the obligation to pay people who borrow money.

At the same time, the business models of insurance companies and pension funds might also be undermined by a protracted use of negative rates. Indeed, they may be unable to meet fixed long-term obligations. Regarding insurance companies, insurances which were stipulated before the advent of negative rates are endangering the solvency of insurance company which are paying high premia to their clients. Concerning pension funds, their liabilities have been drastically inflated by the free fall in discount rates.

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<sup>23</sup> The term "maturity transformation" indicates when banks finance long-term investments (i.e., mortgages) through short-term sources of finance (i.e., deposits from savers).

<sup>24</sup> Vault cash held by MFIs and interest rates (ECB paper, Box 3, Chart A).

### **1.5.5. Disillusion**

Since the outbreak of the 2008 crisis, central banks have been increasingly perceived as institutions which have the unlimited power to boost growth and stimulate the economy through unconstrained monetary interventions in financial markets. This belief, which originated in the United States and is now widely diffused among market participants, led to the idea that central banks can always save the day. As a result, central banks are now subject to an extra pressure, as they are expected to use the monetary printing power to buy very large amounts of government debt (i.e., sovereign bonds), move the interest rate at the desired level and continue its large-scale asset purchases program until the desired effects on employment, inflation and growth show up. Unfortunately, as the final result is uncertain and there is no guarantee that the central banks' operations will reach the set target, the outcome might be disillusionment, with deleterious effects on central banks' authority.

At the same time, confidence in the market could deteriorate as well, as the flattering level of the nominal long interest rate is only resulting from massive public intervention rather than market well-functioning.

Finally, the risk of disillusion comprehends even households, as they may increase – rather than reduce – their savings, worried by the low returns they observe on the market.

## **Chapter II. The disruption of the traditional interest-driven banking model under NIRP**

Negative rates, by stimulating the economy, might be beneficial for financial institutions, as they increase loan demand, improve asset quality, and reduce the riskiness of loans (which is measured by the default rate). However, a negative rates environment gives rise to several concerns about the health of the banking system, as it significantly affects the interest-driven business model of commercial banks.

In the following sub-section (2.1), we are going to discuss whether a cut to negative rates has a different impact on banks according to their business model. We are then going to assess whether cuts to negative interest rates may be considered "special", in that they have a stronger financial stability impact than conventional cuts to non-negative rates.

Subsequently, in sub-section 2.2, we examine the two main potential side effects which a NIRP might have on the banking sector. These two risks are represented by the extra pressure on the profitability of financial institutions and the consequent disproportional demand for assets with a high risk profile.

In sub-section 2.3, we then review the five options which banks can adopt to increase their profit margin in such situation.

Afterwards, in sub-section 2.4, we examine how banks' profitability is differently affected according to their base country. We also present two examples of how two Italian banks (*Fineco* and *UniCredit*) have started to indirectly pass-through negative rates to their clients.

Finally, in sub-section 2.5, we briefly consider the future challenges which financial institutions will have to face under a persistent negative rates environment.

## **2.1. The impact of negative rates depending on banks' business models**

To assess whether there are some types of banks which are perceived to be riskier than others by markets in a negative rates environment, we rely on a study conducted by the ECB<sup>25</sup>.

In the analysis, the risk impact has been measured right after three successive 10 bps deposit facility rate (DFR) cuts by the ECB to negative levels – 5 June 2014, 4 September 2014, and 3 December 2015. The impact of negative rates on banks is measured by the “SRisk” – the estimated capital shortfall of a bank – as we are interested in the bank’s risk of being undercapitalized in a potential future stress scenario. This coefficient is built as a function of a bank’s equity market valuation, its leverage ratio, and the volatility of its stock price with the world index. Therefore, we can safely assume that SRisk represents a good indicator of market-based stress test.

The results of this investigation by ECB show that after a cut to an increasingly negative rate, some banks – not all – are perceived as riskier, in the sense that markets deem them to be more prone to become undercapitalized in a potential financial crisis. Indeed, this confirms that the risk impact is contingent to banks’ business models. Large banks, with diversified streams of income, are perceived to be less (systematically) risky – they even seem to profit from negative rates. Indeed, such large sound banks, in some cases even succeeded in passing on negative interest rates to their corporate depositors without absorbing the full hit of such policy on their interest margins. On the contrary, financial markets consider smaller banks, which heavily rely on deposit funding, as riskier. Therefore, we conclude that the characteristics of a bank represent a critical factor in the transmission of a negative rates policy to the banking sector.

Finally, the researchers also observed that a DFR cut from +25 bps to zero – in July 2012 – triggered a SRisk response which was much smaller than the 2014 and 2015 cuts below zero. Therefore, it has also been proven that cuts to negative rates may be considered special in the

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<sup>25</sup> Working Paper Series, “Do negative interest rates make banks less safe?”.

sense that they carry a bigger financial stability impact than conventional cuts to positive rates.

## **2.2. Effect of negative policy rates on bank profitability, lending rate and risk-taking behaviour**

In the present section we are going to discuss some of the main effects of negative rates on the banking sector. In particular, we will take into consideration two consequences of a NIRP on European banks – reduced interest margin and the resulting search for yield – and we will examine how the ECB is managing these consequences.

### **2.2.1. Bank profitability and lending rate**

As we have seen in section 1.5.4, due to many factors (above all fierce competition), banks are usually reluctant to pass on negative rates to their retail depositors. As a result, their interest margins – and hence profitability – are drastically shrank (this is particularly true for banks with high deposit-to-asset ratio<sup>26</sup>).

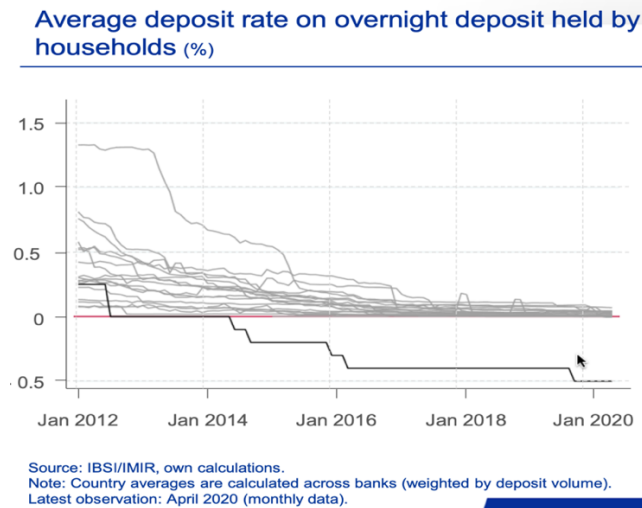
In an extreme scenario, in order to compensate for their reduced profitability, banks could start charging higher interest rates on their lending activities, thereby reversing the intended effect of such accommodative monetary policy. If this was to happen, the zero lower bound would be replaced by the so-called “effective lower bound”, which coincides with the “reversal rate”, that is the interest rate level at which additional policy cuts would become contractionary – as the costs of hoarding and storing cash would become more attractive than holding bank deposits.

Yet, the data displayed below on the volume of overnight deposits held by households (figure 18) confirm that, on average, European banks did not significantly pass on negative policy rates to retail deposit rates. Indeed, such rates have now converged to a level of approximately 0%.

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<sup>26</sup> See sub-section 2.1.

Figure 18. Volume of overnight deposits held by households

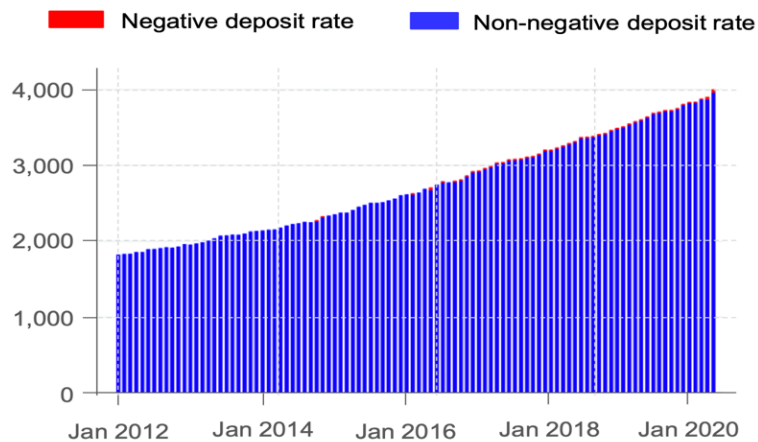


Source: ECB

On the contrary, whereas only a minor share of retail deposits are charged with negative rates, banks are often remunerating deposits held by NFCs at negative rates. Indeed, figure 19 shows how little is the percentage of overnight deposits held by households and that are charged at negative rates. On the contrary, figure 20 illustrates how banks in some countries (Germany, Netherlands, and Luxembourg among the others) have recently started charging negative rates to non-financial corporations.

Figure 19. Remuneration of retail deposits

**Volume of and interest rate on overnight deposits held by households (EUR bn)**



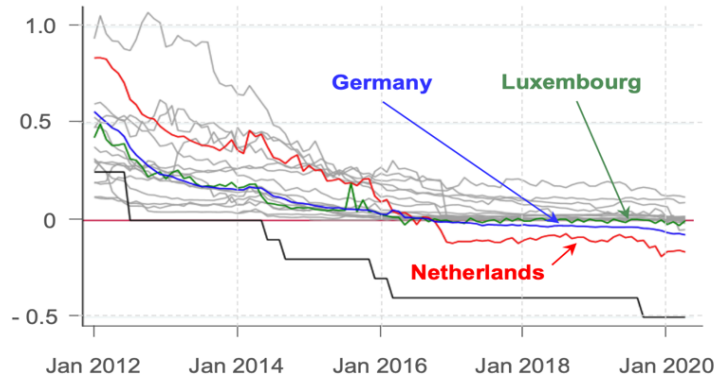
Source: IBSI/IMIR, own calculations.  
Note: The threshold for negative deposit rates is set at  $\leq 1$  basis point.  
Latest observation: April 2020 (monthly data).

Source: ECB



Figure 20. Remuneration of deposits held by NFCs.

**Average deposit rate on overnight deposit held by non-financial corporations (%)**



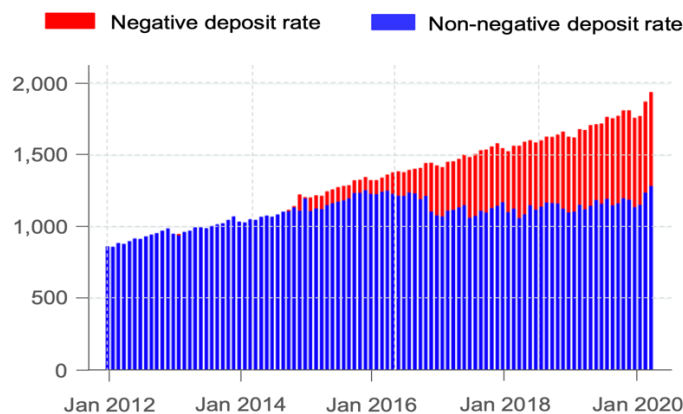
Source: IBSI/IMIR, own calculations.  
 Note: Country averages are calculated across banks (weighted by deposit volume).  
 Latest observation: April 2020 (monthly data).

Source: ECB

Additionally, as the figure below indicates, there is also evidence that negative rates have been affecting a growing share of deposits held by NFCs in the last few years, indicating that the pass-through has steadily increased over time.

Figure 21. Negative rates affecting deposits held by NFCs.

**Volume of and interest rate on overnight deposits held by non-financial corporations (EUR bn)**



Source: IBSI/IMIR, own calculations.  
 Note: The threshold for negative deposit rates is set at  $\leq 0\%$ .  
 Latest observation: April 2020 (monthly data).

Source: ECB

This result confirms ECB’s rationale for negative interest rates: as rates become more negative and the pass-through to corporate deposits

intensifies, firms reduce their cash holdings through investments, thus enhancing the monetary stimulus.

Now that we have discussed the negative impact of a NIRP on interest margins, we examine some other banks' streams of income which are positively affected by a negative rates environment.

For example, by stimulating aggregate demand, negative rates led to an improvement in the macroeconomic outlook, thereby enhancing credit quality throughout financial markets. As a result, banks also benefited from such policy, as it reduced their expenses related to loan loss provisions<sup>27</sup>.

In addition, the ECB enacted two supplementary policy measures with the aim of mitigating the negative consequences of a NIRP on bank profitability i.e., to protect the bank lending channel.

The first consists in the implementation of a two-tier system through which a large part of excess reserves is free from negative rates. Indeed, this measure introduces a new remuneration scheme with two distinct rates applicable to different parts of the banks' excess reserves. Hence, the two-tier system aims at supporting the bank-based transmission of monetary policy, while preserving the positive effects of a NIRP.

The second measure which was adopted by ECB to relief banks from the extra pressure exercised by negative rates, consists in the Targeted Longer-Term Refinancing Operations. Through TLTROs banks can secure loans at highly favourable rates, given that they extend enough credit to the real economy.

To summarize, ECB introduced a dual rate system, according to which the pricing of TLTROs deviates from the key policy rate, in order to lower the funding conditions of banks and thereby compensating for the reduced interest margin due to negative rates.

As a result, according to an ECB's analysis conducted on a large sample of European banks, the NIRP did not had a significant impact on bank profitability over the period from 2014 (when negative rates were first adopted) to 2019<sup>28</sup>. Indeed, on average, the adverse effects

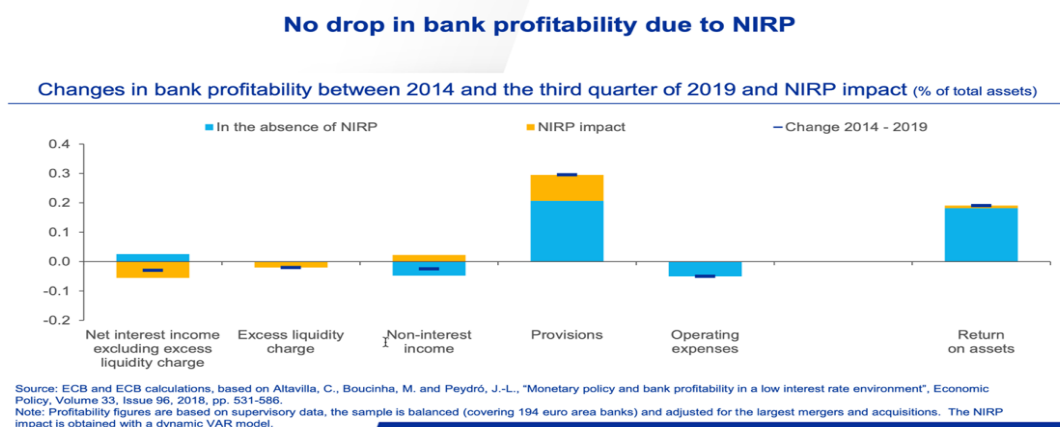
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<sup>27</sup> A loan loss provision corresponds to an income statement expense which banks set aside as an allowance for uncollected loans and loan payments. Such provisions include different kinds of losses due to loans' defaults (i.e., renegotiated loans, non-performing loans).

<sup>28</sup> The analysis is based on Altavilla, C., M. Boucinha and J.-L. Peydró (2018), "Monetary policy and bank profitability in a low interest rate environment", *Economic Policy*, 33, pp. 531–586.

on bank profitability from lower interest margin and the tax on excess reserves, were compensated to a large extent by a drop in loan-loss provisions, as it is depicted in the figure below.

Figure 22. Breakdown of bank profitability



Source: ECB

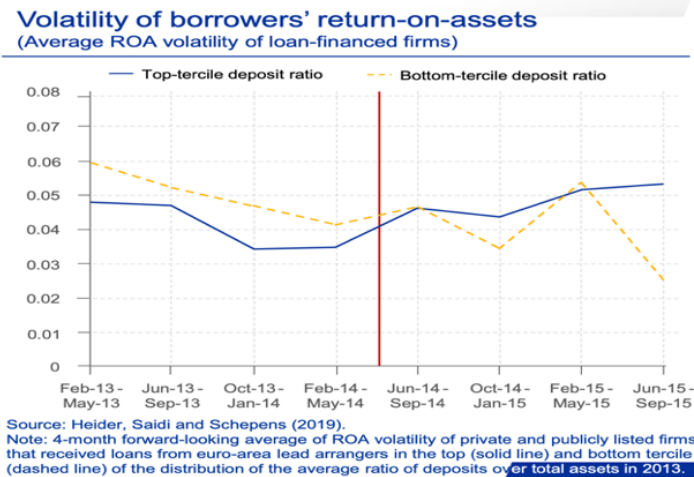
### 2.2.2. Bank's risk-taking behaviour

A second concern is represented by the effects that negative policy rates produce on banks' risk-taking behaviour, which is fuelled by a search for yield.

A study by Heider, Saidi and Schepens (2019)<sup>29</sup>, showed that the introduction of a NIRP by ECB led high-deposit banks to sustain much more risk – by lending to borrowers with a larger return-on-assets (ROA) variation – than low-deposit banks usually do. Indeed, figure 23 shows how, right after ECB first introduced negative rates in June 2014 (indicated in the graph by the vertical red line), ROA volatility increased.

<sup>29</sup> See Heider, F., F. Saidi and G. Schepens (2019), "Life below zero: Bank lending under negative policy rates", *Review of Financial Studies*, 32, 3728–3761. See also ECB Research Bulletin No 43.

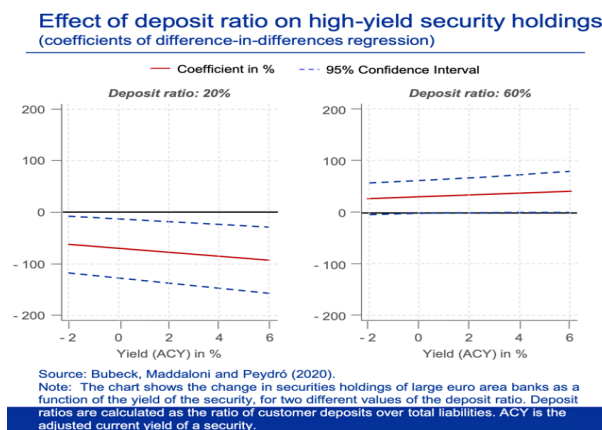
Figure 23. Bank lending to borrowers with larger ROA variation



Source: ECB

However, the researchers also pointed out that this excessive risk taking is mitigated by the fact that even though the borrowers do exhibit a higher volatility of returns, they present lower levels of leverage and same profitability as the borrowers of low-deposit banks. On the same line of Heider et al. study, we find the analysis carried out by Bebeck, Maddaloni and Peydró (2019), who investigated how negative policy rates affect banks' portfolios of securities<sup>30</sup>. The figure below summarizes the authors' conclusions, that is in a negative rates environment banks relying more on deposits tend to expand their holdings of high-yield securities – especially relative to low-deposit banks.

Figure 24. Banks' holdings of high-yield securities



Source: ECB

<sup>30</sup> See Bubeck, J., A. Maddaloni and J.-L. Peydró (2019), "Negative monetary policy rates and systemic banks' risk-taking: Evidence from euro area administrative securities register", *Journal of Money*.

Moreover, this abnormal search-for-yield displays effects which are stronger for less capitalized banks, with potential disruptive consequences on financial stability.

Lastly, as Bittner et al. (2020)<sup>31</sup> proved in their research paper, there are some real economic effects which an overall assessment of the consequences of a negative rates' policy should include as well. Indeed, even though negative rates led to a boom in bank lending rate, which resulted in banks making loans to borrowers who might present a riskier profile, these same borrowers will contribute to the increase in investments in the real economy, hence fostering employment.

Thus, the final aim of the ECB's accommodative policy will be achieved, and hopefully inflation will rise again. Nonetheless, it is true that such mechanism must be strictly regulated – and even short-lived –, as in the long-run it may trigger financial stability's issues.

### **2.3. Banks' alternative options to increase profit margins in a negative rate environment**

Within a negative rates environment, banks have five main levers that they can use to increase their depressed profit margins. In the present section, we are going to look briefly at each option, examining how well they would work in the current climate and what are their main disadvantages.

#### **2.3.1. The first lever: using interest rates at the short and long end of the yield curve**

Since the interest rate on any investment rises as its maturity increases, banks can increase their returns by issuing longer-term loans or by investing in assets with long maturities. Indeed, by seeking high returns through long-term investments, banks can successfully boost their profitability. However, this comes with three main disadvantages.

First, by increasing the share of long-term mortgages, the banks' assets become increasingly illiquid. This result, in turn, rises

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<sup>31</sup> See Bittner, C., D. Bonfim, F. Heider, F. Saidi, G. Schepens and C. Soares (2020), "Why so negative? The effect of monetary policy on bank credit supply across the euro area", unpublished working paper.

concerns about the ability of the bank to pay off its debts (solvency risk) due to the lack of marketability of its investments, which cannot be sold quickly enough to prevent or minimize eventual losses (liquidity risk).

Second, if banks resort to short-term funding to lend over the long run, they could run into trouble as soon as the ECB increases interest rates again (interest rate risk). On that occasion, long-dated assets would lose value while on the liability side short-term funding would soar.

Third, the effectiveness of this lever is very limited. Since the demand for long-term investments rose in the last period, interest rates fell, with a consequent increase in prices. For example, in Germany, the yield on the ten-year federal bonds (Bunds) is -0.20%, and the only yield still generating a positive return on government bonds is the one with a thirty-year maturity – which produces a return of 0.35%<sup>32</sup>. Therefore, in the current climate, to obtain one percentage point more of yield, banks need to extend maturities to a considerably greater extent than they did in the past – leaving higher exposure to interest rate risk – or they need to switch to corporate bonds and other riskier assets – with troubling effects on financial stability.

### **2.3.2. The second lever: increasing holdings of risky assets**

Therefore, as mentioned above, an alternative to increasing investments' maturities might be switching to riskier assets, which yield higher returns. This strategy has been pursued by German banks and savings banks, for example, whose shares of *prime* assets have been substantially reduced in favour of those with lower ratings since 2011<sup>33</sup>. The drawback of this alternative is intuitive: go too far and financial institutions will detain shares of risky assets which are so high that financial stability might be undermined.

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<sup>32</sup> <https://www.bloomberg.com/markets/rates-bonds/government-bonds/germany>.

<sup>33</sup> Speech by Dr Andreas Dombret, Member of the Executive Board of the Deutsche Bundesbank, at the Sparkassen-Gesprächsforum, Witten, 1 February 2017.

### **2.3.3. The third lever: finding new sources of income**

So far, we have only looked at the possible options which banks can adopt in the attempt of salvaging the interest-driven business model over time. However, as we have seen, this only works temporarily.

Lever three, on the contrary, aims at resolving the problem in a rather more hands-on manner. Indeed, to offset the decline in net interest income, banks have usually turned to the commission income, thus raising their operating fees. For example, between 2014 and 2015, the Saving Banks Finance Group reported to have raised its net fee and commission by almost 9%.<sup>34</sup>

Even though it may be unpleasant for the banks' customers, this measure is one of the most effective which banks can rely on in the current situation. Indeed, there's no getting around the fact that bank services carry some costs and if banks cannot anymore cross-subsidize these costs by means of interest income, they will start invoicing them directly to their clients.

### **2.3.4. The fourth lever: adopting cost-cutting measures**

Despite the effectiveness of the third lever, it is uncertain whether banks can make up for the drop in interest income on a permanent basis by boosting their commission income.

Therefore, credit institutions should also work on their cost structures. For example, German banks and savings banks have high cost/income ratios – in 2017 it was 73%, meaning that on average they had to spend 73 cents to earn one euro. This data show that there is room for improvement – not only for German banks but for all European credit institutions – and hence they should all work on cost-cutting measures.

However, many reforms in the cost structure can't be implemented overnight, and it will take time before they show positive effects on bank profitability.

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<sup>34</sup> See footnote N.29.

### **2.3.5. The fifth lever: considering consolidation among banks and saving banks**

We now turn to the fifth and last lever: consolidation among banks and savings banks. Indeed, eliminating slack in the banking sector can help ease competition, which eventually improve profitability – fewer financial institutions allow for higher interest margins.

However, this measure comes with some disadvantages as well.

First, more consolidation and mergers do not necessarily imply better credit institutions. Indeed, there is no guarantee that aggregating two institutions running similar business franchises effectively addresses their reliance on net interest income.

On the contrary, one might say that merging two weak institutions only result in a bigger one which is still weak. This, in turn, raises concerns about the financial stability of the banking sector, which would be full of credit institutions which are *too big to fail*.

Second, savings and cooperative banks have already aggregated their computer centres at the highest tier of their respective networks. Therefore, as so many synergies have already been exploited, it is uncertain whether there is still room for improvement.

## **2.4. Recent data about the consequences of negative rates on European banks**

In this section we present an asymmetry which is emerging with respect to the different impact that ECB's policy of negative rates is having on the banking sector of southern and northern European countries. We then turn to some case studies about how banks can indirectly pass-through negative rates to their clients (i.e., *UniCredit* and *Fineco*).

### **2.4.1. The impact on bank profitability depending on the country**

Since 2014, European banks have paid out to the ECB 34 bln of euro as negative interests on their deposits of excess reserves. In 2020, it was established a new record of 8.5 bln of euro, of which 5.2 bln (corresponding to 60% of the total) were charged to German and French



banks – 2.7 bln and 2.5 bln euros respectively –, while for Italian banks the cost was limited to 362 mln<sup>35</sup>.

At the same time – as we have discussed in sub-section 2.2.1 – to mitigate the extra pressure on bank profitability, the ECB carried out TLTROs, through which banks can secure borrowings at highly favourable rates (up to -1%), given that they respect several conditions. Moreover, the ECB inspired its tiering system<sup>36</sup> to the SNB's one, allowing for a proportion of bank deposit – currently set at six times their mandatory reserves – to be exempted from negative rates.<sup>37</sup>

Through this countermeasure, banks save an amount of money which nearly offset the one spent on excess reserves (8.4 bln of euro in 2020). However, the problem is that these gains are not distributed homogeneously among European banks, as southern countries' banks (Greece, Italy, Spain, Portugal and in part even France) are the ones which benefit the most from TLTROs.

A study by the German Fintech *Deposit Solutions* shows that in 2020 Italian banks nearly doubled the funds obtained through TLTROs, borrowing money for an amount of 374 bln – corresponding to 10% of their assets (while for Greek banks funds borrowed through TLTROs even represent 12% of their assets)<sup>38</sup>.

Therefore, banks of southern Europe are able to offset the negative effects of ECB's NIRP through TLTRO's financing – Italian and Spanish banks are even left with a surplus of 1.6 bln and 1 bln of euro each. On the contrary, the balance is negative for Dutch banks (-342 mln), French banks (-412 mln) and above all German banks (more than a billion euros of losses).

However, even though the situation sounds pretty reassuring for southern Europe's banks, there are many risks which derive from an excessive use of TLTROs as well. Indeed, banks are becoming heavily

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<sup>35</sup> See article by Il Sole 24 Ore, "Banche, con i tassi sotto zero in Europa guadagnano solo Italia e Spagna", Cellino e Bufacchi, 30 Aprile 2021.

<sup>36</sup> The ECB tiering system for the liquidity excess has been implemented by ECB in 2019, in order to mitigate the negative pressure exerted by negative interest rates on bank interest margins. ECB tiering is also called two-tier system, as it allows banks to exempt a large part of their excess reserves from negative rates.

<sup>37</sup> See Investire.it (2020), "Interessi negative e BCE, l'Italia salva grazie al nuovo sistema di Tiering", <https://www.investiremag.it/investire/2020/01/23/news/interessi-negativi-e-bce-l-italia-salva-grazie-al-nuovo-tiering-9872/>.

<sup>38</sup> See Deposit Solutions, 22 April 2021, "Negative Interest Rate Burden of Eurozone Banks Rises to Record High", press release [https://www.deposit-solutions.com/wp-content/uploads/2021/04/20210421\\_DS\\_PR\\_Neg-Rates-Vol-3\\_English\\_FINAL\\_CLEAN\\_2.pdf](https://www.deposit-solutions.com/wp-content/uploads/2021/04/20210421_DS_PR_Neg-Rates-Vol-3_English_FINAL_CLEAN_2.pdf).

dependent on such financing channel and several problems are likely to arise when these loans will expire. For example, in 2023 1300 bln of euro borrowed through TLTROs by European banks will have to be paid back. If we consider Italy, which currently detains 25% of such debt, it is most likely that the debt will have to be re-financed. However, it is unlikely that Italian banks will have access to the same favourable conditions which we currently observe on the market, unless the ECB adopt some new measures.

In conclusion, the Italian case represent a representative example of how delicate the European situation is. Hence, for the sake of financial stability, it is necessary to gradually reduce, on the long-run, European banks' dependence over ECB's borrowing mechanisms (such as the TLTRO).

#### **2.4.2. How European banks are starting to indirectly pass-through negative rates to their clients: the Fineco and Unicredit cases.**

Even though banks are reluctant to pass on negative rates to their clients – due to the fierce competition –, they can adopt other measures to indirectly shift – at least partially – the burden of such policy to their customers.

We here discuss some examples of how banks have done so in the years following the NIRP's introduction.

Let's start from the case of an Italian bank, namely FinecoBank S.P.A. The Italian listed company has recently announced that starting from the 18<sup>th</sup> of May 2021, it will implement serious measures with the aim of reducing large inactive deposits. In particular, Fineco will shut down deposits account which contain more than 100,000 euros and are free of any form of investment or mortgage.

The drastic measure was justified to the depositors by Fineco's CEO, Alessandro Toti, who said that their objective is to foster the transmission of ECB's negative rates to the real economy, and they intend to do so by shutting down large inactive deposits which reduce liquidity circulation, thereby undermining ECB's aim of increasing spending in the real economy and boosting inflation.<sup>39</sup>

While this is certainly true and Fineco is standing by the principles set forth by the ECB itself, it is also true that the measure implemented by the Italian bank aims at reducing the costs stemming out from large inactive deposits. Indeed – as we have previously discussed – since banks' interest margins have been heavily depressed, Fineco cannot any longer profit from its' customers large deposits unless they are somehow invested.

On the same line we find the measures adopted by another large Italian financial institutions: UniCredit. In order to compensate for the reduced profitability due to ECB's negative rates, UniCredit has chosen to opt for the third lever we described in sub-section 2.3.3, as it will raise its operating fees on most of its deposit accounts. For example, the monthly payment for the MyGenius deposit account has

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<sup>39</sup> See Morya Longo, 23 March 2021, "Foti: «Vi spiego perché Fineco ha preso di mira i grandi conti correnti»", Il Sole 24 Ore, <https://www.ilsole24ore.com/art/foti-vi-spiego-perche-fineco-ha-preso-mira-grandi-conti-correnti-ADctKJSB>.

increased from 1.78 to 3.03 euro – an increase of nearly 70%.<sup>40</sup> Additionally, UniCredit provides an example of a direct pass-through of negative interest rates. Indeed, since 2020, the Italian banks has been charging a fee of €33 per month on corporate deposit exceeding €100,000.<sup>41</sup>

The two examples we provided, illustrate how banks can still pass-through at least part of the burden of negative rates to their customers, even without cutting their deposit rates to negative levels.

Finally, we also need to take into consideration that the current situation has been worsened by the pandemic emergency, which led to customers acting out of fear and increasing the amount of money deposited in their bank account, with less investment and mortgages going on. This, in turn, has led to an accumulation of uninvested deposits by bank account holders, worsening an already critic situation for the banking sector. With respect to 2019, the expansive ECB monetary policies have contributed to lowering the Euribor to a level such that every three months, a large deposit account would cost the bank €24.5<sup>42</sup>.

Therefore, Fineco and UniCredit's choices must be placed within this context of negative rates and pandemic emergency.

## **2.5. The troubling future of the banking sector under a prolonged negative rates environment**

Despite the overall assessment which may be seen as positive, a persistent period of ultra-low and negative interest rates may not be sustainable for European banks and might pose additional challenges. Indeed, it is true that in the short-run, through low interest rates, the ECB has cushioned the impact of the crisis, created an investment-

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<sup>40</sup> See QuiFinanza, 13 Aprile 2021, "Unicredit, inizia l'era Orcel: stangata sui conti correnti e chiusura di 450 filiali", <https://quifinanza.it/soldi/video/unicredit-orcel-aumento-conti-correnti-chiusura-filiali/480089/>.

<sup>41</sup> See Rossi E. (29 March 2021), "Conti Correnti, cosa faranno Intesa Sanpaolo, Unicredit, BNL, BPM, Bper, Fineco e non solo", in Start Magazine, Economia, <https://www.startmag.it/economia/intesa-sanpaolo-unicredit-bnl-bper-banche-conti-correnti/>.

<sup>42</sup> See Battaglia A. (19 March 2021), "Tassi Negativi le banche italiane iniziano a correre ai ripari" in Wall Street Italia, <https://www.wallstreetitalia.com/tassi-negativi-le-banche-italiane-iniziano-a-correre-ai-ripari/>.

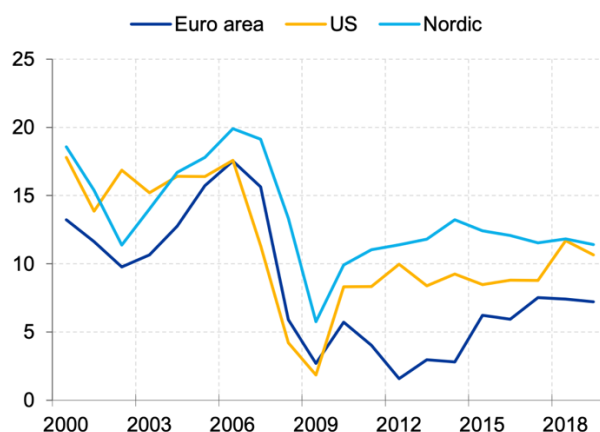
friendly environment for enterprises and even benefited consumers who can now borrow money from commercial banks at much lower rates. All these effects have contributed to propping up the gradual economic recovery and stabilizing the economic environment.

However, this does not imply that the ECB's accommodative monetary policy is free of risks.

Beyond the risks we have examined throughout this paper, it is not even certain that negative effects on bank profitability due to depressed profit margin will always be compensated by lower loan-loss provisions. This is particularly true if we also consider the current pandemic<sup>43</sup>, which is likely to increase the pressure exerted on banks' profitability due to rising loan-loss provisions and defaults. Indeed, as the graph below suggests, bank profitability has changed significantly over the past two decades.

Figure 25. Bank profitability over time

Long-term evolution of banking sector profitability: return on equity (%)



Source: Bloomberg, ECB calculations.  
 Note: The sample consists of 21 large banks for the euro area, 17 for the United States and 6 for the Nordic countries.

Source: ECB

Therefore, the deterioration of the current scenario of economic recovery – from both the 2008 crisis and the Covid-19 pandemic – and the realization of the several risks created by a NIRP can only be avoided if a forceful policy response is enacted directly by

<sup>43</sup> Jordà, O., S. Singh and A. Taylor (2020), "Longer-run economic consequences of pandemics", NBER Working Paper no. 26934.

governments, with the aim of raising potential growth<sup>44</sup>. Indeed, while the ECB can only mitigate potential negative effects, monetary policy cannot intervene on the structural causes which underly these problems.

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<sup>44</sup> See ECB Financial Stability Review, May 2020.

## Conclusive remarks

In this section, we briefly recap the results of our analysis. In the first chapter, we introduced the concept of negative rates – first in real and then in nominal term. We went through the main drivers of the ECB decision of cutting the DFR to negative levels in 2014 – mainly the lack of inflation – and we analyzed the post-crisis context in which the central bank's choice was made. We then turned to the functioning of negative rates and the different transmission channels through which such policy affected the economy. The first channel is the credit one, and it reflects the main aim of the ECB's policy: to deter savings and boost borrowing throughout the economy. This was accomplished by imposing a tax on banks' reserves deposited at the central bank, thereby incentivizing credit institutions to lend more to the public rather than being charged on their money parked at the ECB. The second channel is represented by the asset valuation one, as its objective is to inflate asset prices through reduced discount rates on assets' cash flows (i.e., dividends). The third channel consists of the portfolio balance and risk-taking one and describes investors' incentive to shift out of government bonds and into riskier assets. The fourth channel is the reflation one, as it encompasses ECB's commitment in lifting inflation towards a fixed target, by warding off the risk of a deflationary spiral. The fifth and last transmission channel is the exchange rate channel and describes the possibility which countries have, to boost growth and employment through the depreciation of their home currencies. This can be accomplished by lowering interest rates, which in turn increase inflation's expectation and thereby import prices. Then, we outlined the main benefits of going negative according to the ECB's experience. We looked at the data from money market (i.e., EONIA forward curves and volatility, 3-month EURIBOR), we studied how they reacted to the NIRP and finally we confirmed that negative rates had a greater impact along the yield curve than a standard rate cut. We concluded *chapter I* with an investigation of the main risks which a negative rates environment poses on the economy on the long-run. These five unintentional effects can be summarized as: disincentive, distraction, distortion, disruption, and disillusion. The first one,

disincentive, relates to the disincentive to fiscal consolidation which governments are provided with by negative interest rates. The second one, distraction, describes a situation in which financial markets focus obsessively on monetary policy, ignoring the real challenges of economic policies. The third one is the distortion effect, as in the current climate central banks replace economic fundamentals in setting market valuations and thereby asset prices might be distorted. The fourth one, disruption, refers to the disruptive effects which NIRP have on financial institutions' business models (i.e., commercial banks, insurance companies and pension funds), with consequent risk on financial instability. The fifth, and last, one, is the disillusion effect and describes the eventual loss of confidence by financial markets in central banks, as the result of such unconventional monetary tools is nothing but certain.

In the second chapter, we reached the clue of the analysis as we tried to understand the impact that a policy of negative interest rates has on the European banking sector.

In order to understand how banks' traditional interest-driven business model has adapted to the current climate, we conducted a step-by-step analysis. We first investigated whether banks' different business models react differently to a NIRP. To assess how risky banks are perceived by markets, we used the SRisk, a risk measure indicating the probability of banks becoming undercapitalized under financial distress. We found that small banks which rely more on deposit funding are perceived as riskier than large credit institutions with diversified income. We then examined – and confirmed – that a cut to negative rates has a stronger impact on financial stability than conventional cuts to non-negative rates.

Once we confirmed that the impact of a NIRP on banks does depend on their business model and the overall effect of negative rates is stronger than the one we observe with conventional cuts, we turned to the second part of the analysis. Therefore, we examined banks' internal management of negative policy rates.

Indeed, we analyzed the extra pressure which such an environment exerts on bank profitability. The results showed that banks engage more freely in risk-taking activities, leading to an abnormal demand for high-yielding risky assets.



Therefore, we turned to the options which banks can adopt to increase their depressed profit margin. The first alternative is to use interest rates at the short and long end of the yield curve, meaning to increase their returns by issuing longer-term loans or by investing in assets with longer maturity. The second one is increasing holdings of risky assets, which bring higher profits. The third lever consist of finding new sources of income. Indeed, banks might try to offset the decline in net interest income through higher operating fees (commission income). The fourth option relies on adopting cost-cutting measures in the context of a cost structure reform. The fifth and last alternative available to banks is represented by consolidation in the banking sector.

Finally, we also considered whether bank profitability is affected by their country of residence. We found out that credit institutions in European Southern countries – Spain and Italy in particular – benefited in net terms from NIRP while Northern countries – especially Germany and the Netherlands – bore the real cost of such monetary accommodative policy. We also presented two case studies (*Fineco* and *UniCredit*), which show how commercial banks are indirectly sharing the burden of negative rates with their clients without directly imposing negative deposit rates.

Finally, to complete our analysis of how banks' business model was affected by ECB's NIRP and how banks adapted to this new environment, we briefly discussed the future challenges which stem out from a prolonged period of negative rates.

In conclusion, we can soundly assert that to assess the impact of negative rates on the banking sector, it is necessary to distinguish not only between different business models, but also between European countries, as the impact greatly depends on such factors. Second – and this conclusion is independent from both the bank's business models or its home country – we found out that ECB's NIRP has been beneficial in the short-term but nonetheless can be very dangerous in the long run. Indeed, governments must step in and use the time which ECB's accommodative policy bought them, to implement the structural reforms which are necessary to find a lasting solution.

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