

THE INTEREST RATE UNBOUND?

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SUMMARY

In these remarks, prepared for a conference held at Brookings on June 6, 2016 (“Negative Interest Rates: Lessons Learned...So Far”), Jean-Pierre Danthine asks whether the advent of negative central-bank policy rates in Switzerland, Denmark, the euro-zone, and Japan means that there is no longer a “zero lower bound.” He concludes that rates can go about “one inch” lower than economists previously thought; Switzerland and Denmark are at minus 0.75 percent. But it’s unlikely that rates can go much lower than that without provoking a surge in hoarding of paper currency.

The only way to avoid that undesirable outcome would be either to abolish paper currency altogether or to impose a penalty on people who choose to hold paper currency instead of electronic cash. Neither of those approaches is likely to be adopted in a democracy, especially if ordinary savers confront negative rates—that is, if banks charge fees rather than pay interest to put money in an account.

There is one option for which the Swiss experience may be a prelude. In Switzerland, negative rates are largely seen in the money and bond markets; banks aren’t imposing negative rates on savers or borrowers. A central bank could impose a fee on wholesale cash transactions between the central bank and cash handlers (to discourage cash hoarding on a massive scale), but structure the fee so that most retail bank customers aren’t affected (perhaps requiring that banks pay interest on accounts under a certain threshold.) A major drawback of this approach, though, is that it dilutes the economic oomph of negative interest rates. It may suit small open economies looking to restore an appropriate interest differential but not large economic areas in search of a monetary stimulus. In the latter case, monetary and fiscal authorities would need to rely on other tools.

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1. INTRODUCTION

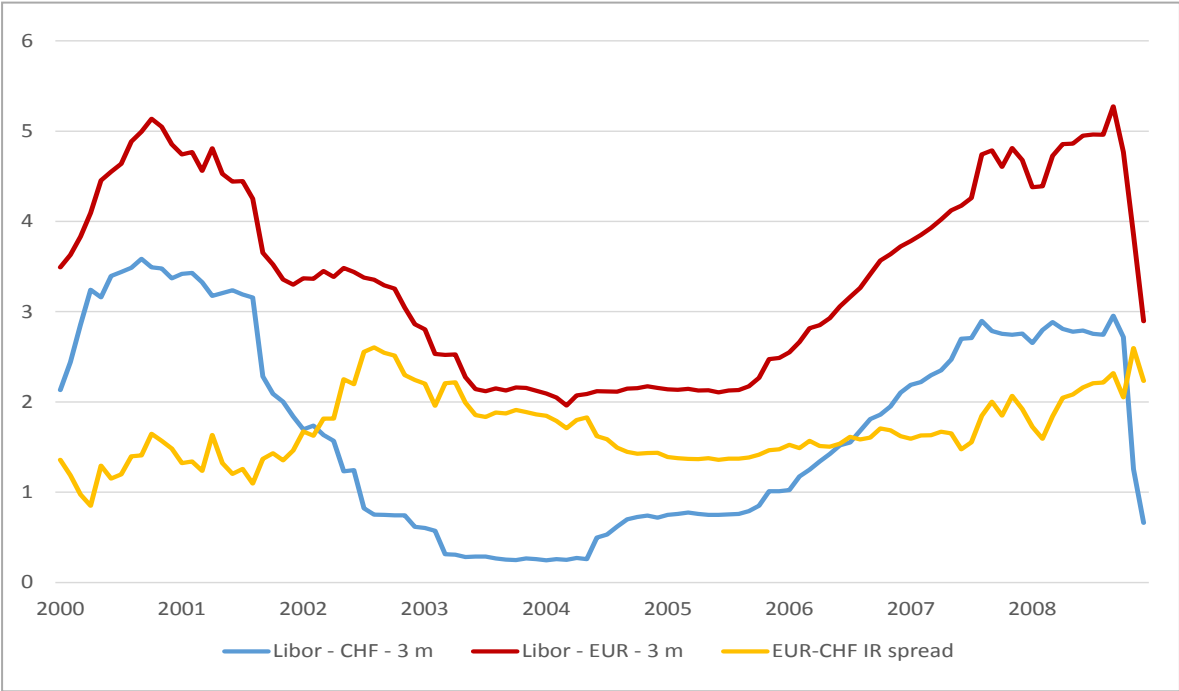
Since 2014 five central banks, including the Swiss National Bank (SNB), have set their policy rates below zero. In this note I review elements of these recent experiences, focusing in particular on the Swiss case. I do this in search of a preliminary answer to the question: do these developments represent the premisses of a full emancipation from the ZLB?

Central banks' motivations for going below zero have been diverse. The clearest cases are probably those of Denmark and Switzerland. In these two countries the unambiguous goal was to protect an exchange rate parity. The Danish krone has been linked with the Euro (and before with the Mark) for decades. When the credibility of this link came into question in January 2015, the Central Bank of Denmark (DNB) decided to impose a negative rate on commercial banks' deposits with the stated objective of discouraging speculation by decreasing the expected return on capital flowing into Denmark. With four successive cuts over a 2.5 week period, the interest on bank deposits reached -75bp by mid-February 2015. The pressure on the krona diminished thereafter, permitting the beginning of a reversal – a move up to -65bp – in early 2016.

The Swiss National Bank's (SNB) decision at the end of December 2014 was of the same nature. A negative interest rate on bank deposits of -25bp was announced on December 18 (but the decision was to be effective only one month later) with the goal of alleviating the pressure building up on the exchange rate floor relative to the Euro that had been in effect since September 2011. A further decrease of the rate on bank reserves to -75bp was announced on January 15, 2015, together with the abolition of the floor. Here the objective was to reinstate an interest rate differential with respect to the eurozone, in particular, to limit the appreciation of the CHF that was viewed as the inevitable result of abandoning the floor.

The constraint of the ZLB is particularly acute for a small open economy with a safe haven currency. The ability of the SNB to maintain a negative interest differential, notably relative to rates on euro-denominated assets, is critical to deliver an appropriate exchange rate. Historically, this interest rate 'bonus', which is the premium on the insurance against tail events that is bundled with a CHF investment, was of an order of magnitude in excess of 150bp for the 3-month Libor (Figure 1). By compressing short maturity rates towards zero, the ZLB makes it impossible to maintain the interest rate differential at the required level, a condition that amplifies the appreciation pressures accompanying the occurrence of a crisis (which exacerbates the demand for the safe haven). The ZLB thus represents a particularly severe constraint on Swiss monetary policy and the stakes of removing or alleviating this constraint are correspondingly elevated. As a complement to this assessment, let us note that the domestic economy at the beginning of 2015 was healthy with expected growth above potential and a booming residential housing sector. That is, the state of the Swiss domestic economy did not justify lower interest rates; the motivation for the push below zero was not the search for a monetary stimulus to aggregate demand.

Figure 1 - The Swiss interest rate "bonus"
(based on 3-month market rates, in percentage points)



Exchange rate considerations were less dominant, although also present, in the other three cases of negative policy rates. In the EMU, Japan and Sweden the stated intention was to fight an undershooting of the inflation target (the exchange rate was one of the channels through which the policy move was expected to develop its effect). The ECB moved its deposit rate in negative territory in mid-2014 already to “underpin the firm anchoring of medium to long-term inflationary expectations” (Draghi - 2014). The ECB further lowered its deposit rate to -20bp in September 2014 and -30 bp in December 2015. The Riksbank (-10bp in February 2015 followed by further cuts to -25bp in March 2015, -35bp in July 2015 and -50bp in February 2016) and the BOJ (-10bp in January 2016) used similar wording. In the case of the Riksbank, negative rates were announced simultaneously with the introduction of QE. The aim was “safeguarding the role of the inflation target as a nominal anchor for price setting and wage formation”. After several years of QE, the BOJ imposed negative rates with the goal of strengthening aggregate demand and promoting an inflation rate closer to the stated quantitative target of 2%. The goal of delivering a ‘traditional’ monetary stimulus with the hope of reviving aggregate demand and reaching an inflation target distinguishes these three cases from those of the DNB and SNB.

A distinctive characteristic of the experience of the five countries with negative rates is that they have had no impact on the remuneration on retail bank deposits. This appears to be the result of the reluctance of commercial banks to adversely affect their retail customers for fear of severing client relationships. It is also partly a result of the policy design by the corresponding central banks. The precise design of the negative rate policy is country specific depending on the peculiarities of each central bank's monetary operations. But it is also a function of the impact the adopted measure is likely to have on the profitability and, potentially, on the fragility of the banking system.

Alleviating the burden imposed by negative rates on banks is likely necessary for jurisdictions where the imposition of negative rates has been preceded by a significant injection of liquidity (see Cechetti and Schoenholz, 2016). Whether it is possible to alleviate the burden on the banking sector without at the same time weakening or negating the potential impact of negative rates on the economy depends on the intentions of the corresponding central bank. The Swiss case is again the clearest in this respect. The injection of liquidity preceding the imposition of negative rates has been the largest as a share of GDP with the SNB balance sheet approaching 100% of GDP. Since the transmission of the negative rates to bank credits was not essential given the exclusive ER motivation, exempting banks from the interest charge was relatively innocuous provided marginal interest rates were guided to the desired level. This resulted in the SNB imposing a low rate of -75bp on banks' deposits at the central bank with a large exemption threshold of twenty times required reserves.¹ It effectively meant that banks collectively were subject to negative rates for only a fraction of their deposits at the SNB; in February 2016, on reserves of CHF 170 bil. for total deposits amounting CHF 473 bil. Without this exemption the interest payment from the banking sector to the SNB would have amounted to a substantial fraction of normal profits. For the ECB and Japan who had previously engaged in significant QE operations but whose goal for the negative rates was broader, the trade-off is more delicate and it is not clear that the objectives of maximizing the policy impact is compatible with the perceived need to limit the interest burden imposed on banks.

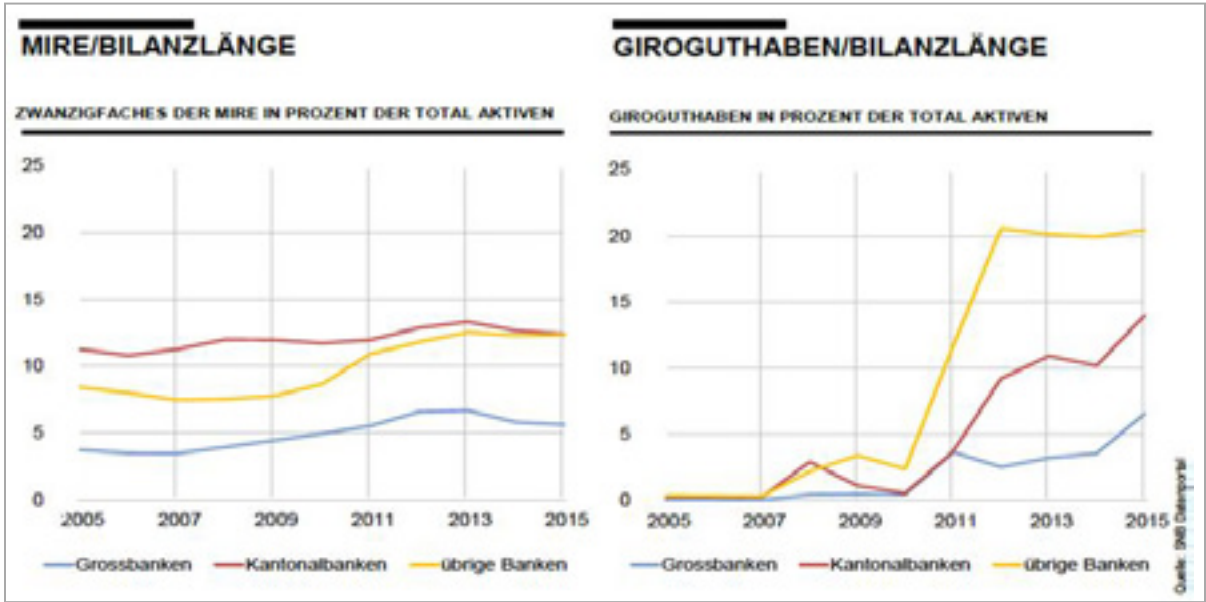
It is worth saying a few words on the public reaction to this novel policy measure. Negative nominal interest rates are counter-intuitive even when negative real rates have been historically frequent. The decision of the SNB to go negative has generated a large amount of mostly acrimonious discussion. The general public has difficulties understanding the logic of negative interest rates. They are viewed as 'unnatural' and a measure of financial repression. How can it be that a saver is not rewarded for postponing consumption? Indeed the world must be upside down when the lender must remunerate the borrower! The advent of negative rates has exacerbated the discussion on the 'spoliation' of savers that had started with the era of ultra low rates. The pension fund lobby has been particularly vocal. By imposing negative rates, it is said, the National Bank makes it impossible for pension funds to reach their return objectives. The public interest would require exempting pension funds, in particular the public social security fund, from the interest charge.

Another dimension of the public discussion has revolved around the exemption policy. The private bank (wealth managers) lobby has been the loudest. The increase in liquidity since the crisis has been differentially distributed among the three groups of banks represented in Figure 2 with the "other banks", dominated by the private wealth managers, outpacing the other two bank groups. This can be seen as the advent of "cash in CHF at the SNB" as a new 'ultra safe' asset class in the context of the crisis, particularly popular among the wealthy and conservative investor-clients of these banks. The result of this development is that the definition of the exemption threshold as a

¹ Calculated with November 2014 as a reference period. The exemption is CHF 10 mios for banks not subject to minimum reserve requirements.

multiple of required reserves did not relieve these banks as much as their competitors, and they are bearing the largest share of the burden of the policy. Given their reluctance to transmit the interest charge to their clients in a context of heightened competition, the burden potentially amounted to a significant fraction of their normal profits. Of course this is not in contradiction with the intentions of the policy with these banks being thus led to propose investment alternatives to their clients (notably in other currencies) and to incentivize them to choose these alternatives by passing on, or threatening to pass on, the negative rates. But the situation has occasionally been exploited by competitors with free margins to attract new accounts leading to cries of unfairness and an intense debate and lobbying effort. Given the technical nature of the issue and the general attitude towards negative rates, the claims of unfairness have attracted a certain degree of sympathy. All this is relevant because, in a direct democracy, even legitimate economic ideas have little future beyond a certain level of unpopularity.

Figure 2 - Commercial banks differently impacted



In this note I address the question whether these developments portend the beginning of the end of the ZLB. There are two related elements of the response to this question. First, one must address the issue of how low one can go? The end of the ZLB is in sight only if one can go substantially lower than the currently observed lower bound. After all, if the latter, -75bp, turns out to be the limit, the margin of maneuvering for central banks exposed to permanently low rates is unlikely to be sufficient. This is notably the case in Switzerland where restoring the normal interest rate differential when the major central banks have their policy rates at zero would require a larger move below zero by the SNB. But this is also true more generally because the more important impact on long rates is bound to be only a fraction of the cut in the policy rate.

The second issue to be addressed is whether the transmission mechanism remains intact under zero. Again, the demise of the ZLB would appear to be near only if the transmission mechanism works symmetrically above and below zero, or at least if it is not significantly weakened when going negative. I look at these two questions in turn.

2. HOW LOW CAN WE GO?

There has been a modest but nevertheless significant evolution of thought on this question. A few years back, the ZLB was taken literally and left unquestioned. Since then the ZLB has given way to the effective lower bound (ELB)!

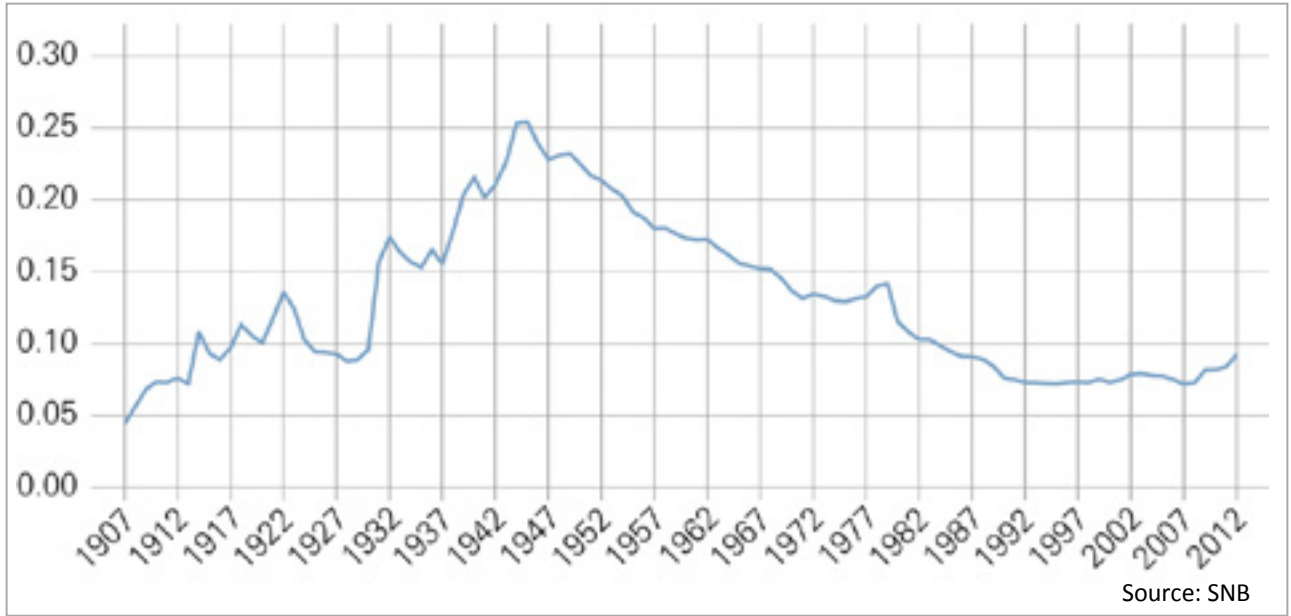
The issue is well known. In current, universal, circumstances, the rate of return on holding paper currency is neither positive nor negative. Hoarding significant amount of paper currency, however, has a cost in terms of transportation, safe storage capacity, insurance and it may further have some inconvenience features. By affecting the possibility of avoiding negative interest rates on bank deposits through paper currency hoarding, these costs define the lower limit to negative interest rates. Today they appear to be “one inch” lower than what one would have thought. According to Bernanke (2016) the Fed staff concluded in 2010 that the interest rate paid on bank reserves in the U.S. could not practically be brought lower than about - 35bp. Other estimates had placed the cost of cash hoarding at closer to 50bp. Since then both Denmark and Switzerland have reached the level of - 75bp. without unleashing a rush for cash. There may still be some maneuvering room but it is unlikely that one can go much lower for much longer. Switzerland is an expensive country. The various costs mentioned above may well be a little higher than the corresponding estimates for the United States. Switzerland is also a small country where, at the margin, moral suasion by the central bank and the civic spirit can be effective in preventing banks from taking actions that could be viewed as undermining a monetary policy decision of importance for the country. From a pure cost perspective, cash hoarding may start paying for itself somewhere in the vicinity of the current rates.

To go significantly lower, the context must be altered quite fundamentally. In order to think about this issue let me start with an assumption. It is that Central Banks would want to avoid paper currency hoarding by the general public (as has been the case so far). Central banks have a legal obligations to provide the national means of payment and they hold stocks of paper currency to meet sudden increases in the demand for cash but they typically do not store enough bills to meet demand if paper currency hoarding were to become pervasive. Rationing paper currency to permit arbitrary low interest rates is not part of a sustainable monetary policy. Yet if rates were to fall much lower and were expected to remain low for a long enough period, and if retail depositors were subject to these negative rates, then paper currency hoarding by the public would likely become prevalent and the first indications that a central bank may have a problem meeting the demand for cash would only accelerate the move. I postulate that the preference of Central banks is to avoid risking such an outcome.

Two directions to avoid paper currency hoarding by the public while permitting arbitrarily low interest rates have been suggested. The first consists in abolishing paper currency altogether (e.g., Buiter, 2009, Rogoff, 2014), the other consists in subjecting paper currency itself to negative rates by introducing an explicit exchange rate between paper currency and electronic money. With paper

currency steadily depreciating against bank or digital money one effectively generates a negative interest rate on currency (Agarwal and Kimball, 2015). The first is clearly more radical than the second and indeed the latter was guided by the objective of proposing “a policy at a minimum distance from the current monetary system”. Nevertheless, directly exposing the general public to the negative interest rate policy would be a significant departure from the current situation. For reasons to be discussed, none of these alternatives appear to be immediately available, certainly not in the Swiss context, as both would require significant legal changes. I will present a more modest, less radical option that might be within reach. The idea is to permit imposing significantly lower rates while simultaneously making sure the negative rates are not transmitted to the general public. The impact of this compromise on the transmission mechanism is not negligible, however.

Figure 3 - Switzerland: Ratio of paper currency in circulation to nominal GDP



Abolishing paper currency? The Swiss love paper currency. Contrary to what is observed in Sweden, the use of cash in Switzerland is still very common including, in certain domains at least, for large payments. As Figure 3 shows, the demand for paper currency stopped decreasing as a proportion of GDP around 1990 and it has increased again as a consequence of the crisis since 2008. Incidentally the increase of late has been concentrated on CHF 1000 bill but it does not correlate with an increase in criminal activities. It is perfectly timed with the advent of the financial crisis that caused an increased mistrust of the banking system. A proposal to abolish paper currency payments would for sure provoke a very lively debate with arguments bearing on safety (theft vs. cybertheft), cost (the use of paper currency is viewed as free, credit card charges are high) and the protection of the private sphere. It would be certain to end with a public vote whose outcome, as of today, could safely be predicted to be a resounding NO. All in all, my (Swiss) take is that paper currency will circulate for a while longer, maybe until the central bank is ready to issue crypto-currency rather than in paper form. A new paper money series was just put into circulation a few days ago (April 2016) replacing a series that was introduced between 1995 and 1997. It can be expected that the new series will circulate at least until 2030.

The second approach, forcing negative rates on paper currency by introducing an explicit exchange rate between paper currency and electronic money, is attractive but, in Switzerland at least, it would equally require significant legal changes; notably but not exclusively because paper currency is the legal tender which would have to be replaced with electronic money. In and of itself, such a legal alteration would probably be within reach but viewed as a means to reaching the goal of permitting the extension of negative interest rates to retail depositors, the outcome would be much less clear. The public discussion would surely focus less on the means than on the goal. As argued above the recent experience – admittedly very short – with negative rates shows that the general public sees them as counter-intuitive and unnatural. The negative reactions have been contained because the man in the street was not affected except indirectly via his pension investments. Cries against such a policy are sure to be even louder with the prospect of everyone being exposed to a negative interest both on his bank deposit and on his paper currency holding. Here as well a difficult democratic debate is sure to take place, the outcome of which would be highly uncertain.

For the reasons just described I believe none of these changes is readily available at least for the central bank of a conservative country with direct democracy. There exists however an intermediate option for which the Swiss experience may be seen as a prelude. It would provide a practical, almost ready-to-adopt alternative to enforcing a significantly more negative interest rate policy. The idea is to impose a fee on wholesale cash transactions between the central bank and cash handlers while simultaneously ensuring that the cost is not passed on to retail depositors. To make this sustainable a necessary, but possibly also sufficient, condition is to design a tiered system. Without exempting most of bank reserves either the burden on the banking system will be such that banks will be forced to transmit negative rates to retail depositors or, if they are prevented from doing so, the interest charge could become excessive, possibly leading to bank failures and a credit crunch, i.e., the opposite of the situation one presumably wants to promote.

Alleviating significantly the financial burden negative rates place on banks makes it possible and likely that banks will not charge negative rates on the deposits held by retail clients, as is currently the case in Switzerland and all other economic areas with negative rates. This statement accords with banks' observed reluctance to pass on negative rates to their retail depositors. If need be, this state of affairs may be consolidated with a legal obligation (sure to be popular) of a non-negative interest rate on deposit balances inferior to a certain limit (say the 100k limit typically used for deposit insurance). Such a legal obligation is in effect in Belgium for instance. Once this is assured, a system must be designed to avoid wholesale cash hoarding by banks and institutional investors. This can be achieved in various ways depending on the particular institutional set-up. In Switzerland, for example, a small number of intermediaries are responsible for the transport of cash to and from the central bank meaning tracking down individual withdrawals and deposits is a simple affair. The simplest system would involve imposing a fixed fee on all cash withdrawals from the Central Bank with an exemption threshold corresponding say to the average yearly withdrawal of the last 5 years. That is, withdrawals in excess of the normal usage determined by the needs of the payment system (corrected by a trend if need be) would be targeted. Alternatively, the fee could

be levied on cash deposits to the Central Bank and it could be modulated as a function of the length of time since the corresponding withdrawal, thus neutralizing the role of time (as a reasonable fixed fee would be too small if the zero interest policy is expected to last long enough). One could as well use the more sophisticated proposal to implement an exchange rate between paper and electronic money at the wholesale level but this is probably needlessly complicated given the intention. Here the goal is to prevent bypassing the negative rate through wholesale paper currency hoarding: a rough mechanism design suffices to ensure 'in mass' hoarding does not pay with the result that no fee will ever be levied. I am convinced that with such a system significantly more negative interest rates than observed today could be attained, sufficiently low to restore the necessary monetary policy margin in a world of permanently lower rates. Obviously the modesty of the reform needed is not without an impact on the characteristics of the monetary transmission mechanism.

3. IS THE TRANSMISSION MECHANISM UNAFFECTED BY ZERO?

What can we say about the mechanism of monetary transmission once policy rates are negative. Lessons here are clearly preliminary. This is the case, first, because the experience with negative rates is short and adjustment time is an important factor. The anticipated duration of the policy matters given that behavioral adaptations have fixed costs. Second, the modesty of the move on the negative side is also relevant for what we can hope to learn from the current experience. Most rates are not expected to go negative at a policy rate of less than -1%. The third limitation of the current experience is that, partly for the reasons just mentioned plus the prevalent tiering system, negative rates have not been transmitted to retail sight deposits in any of the five jurisdictions with negative policy rates. The counterpart of this fact is that banks have also limited the transmission of negative rates to the asset side of their balance sheet, i.e., bank credits have not adjusted or only to a limited extent.

Market rates. In all jurisdictions with negative policy rates it appears that the transmission to market rates, short and long, on public and private debts, has operated in normal fashion. This is clearly the case for money market rates (see Figure 4). This conforms to what could have been expected. The arbitraging possibilities between lending to the central bank and lending to the interbank market ensure that the market rate cannot deviate much from the official rate. The differential element is provided by expectations once one moves beyond overnight deposits. Such expectations have pushed the 3-month Libor on the CHF sometimes significantly below the rate set for deposits at the SNB. Everywhere trade volumes are very low because of super-abundant liquidity. Where the introduction of negative rates has been accompanied with a further increase in liquidity (Euro area) trade volumes have been further negatively affected. The situation is the opposite in Switzerland where the design of the exemption thresholds has stimulated overnight trading between banks below the threshold willing to absorb liquidity (at a price!) and those above the threshold. See Figure 5.

Figure 4 - Key policy rates and money market rates, in percent

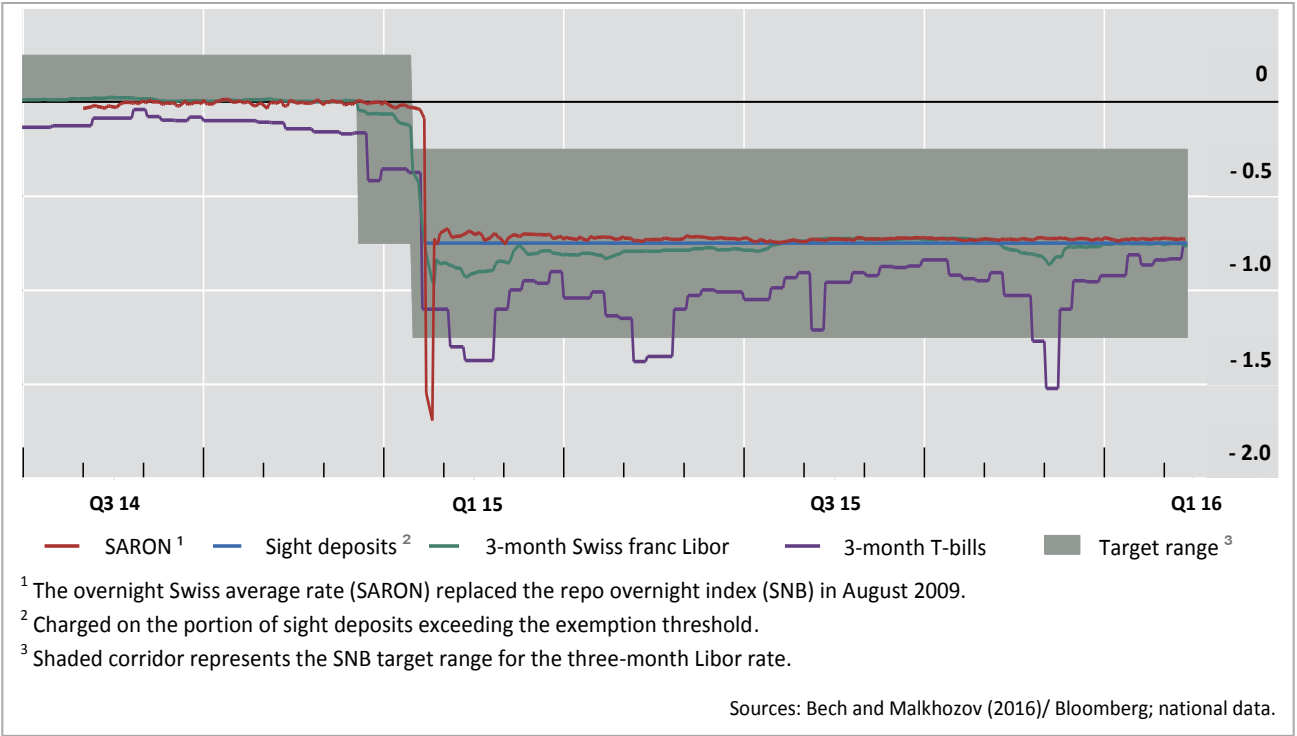
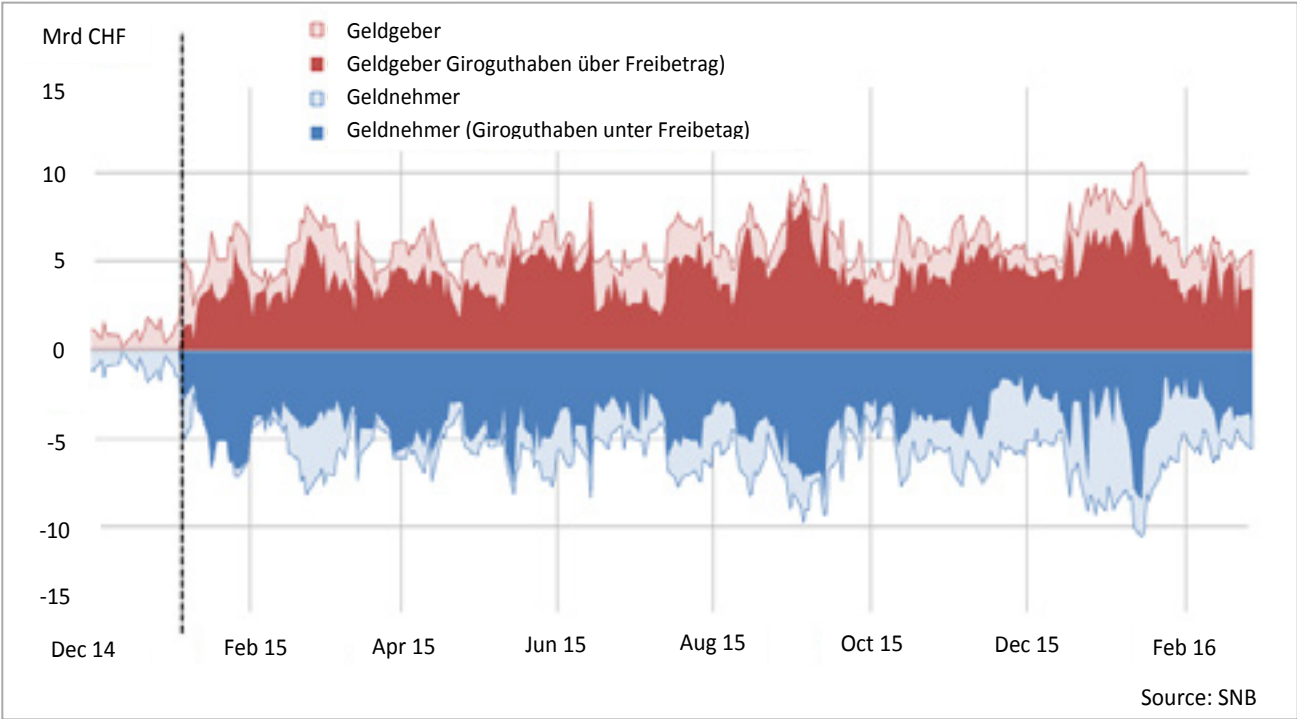


Figure 5 - Repo volumes since the introduction of negative rates



The transmission appears to have been symmetric as well for instruments of longer maturity. Figure 6 shows that the reaction of interest rates on Swiss government bonds to the introduction of negative rates has been significant. In a context of decreasing rates, in particular at longer maturities, one cannot easily isolate the pure effect of the policy move. Nevertheless, taking into account the fact that the SNB first announced the introduction of negative rates on December 18, 2014 at a level of -25bp, effective one month later and then a further decrease to -75bp on January 15, 2015, effective on January 22, the fall in rates over the two month period – end of November to end of January – is the more relevant. The one-year bond rate fell by 72bp over this period, the 5-year fell by 76bp, the 10 year by 38bp and the 30 year by 21bp. In a more systematic but still preliminary study, Grisse et al. (2016) report no evidence of a decline in the average effect of short rate changes on long yields when short rates move to negative territory.

Figure 6 - Swiss government bonds: spot interest rates
(CHF confederation bonds, spot rates estimated using the extended Nelson/Siegel model)

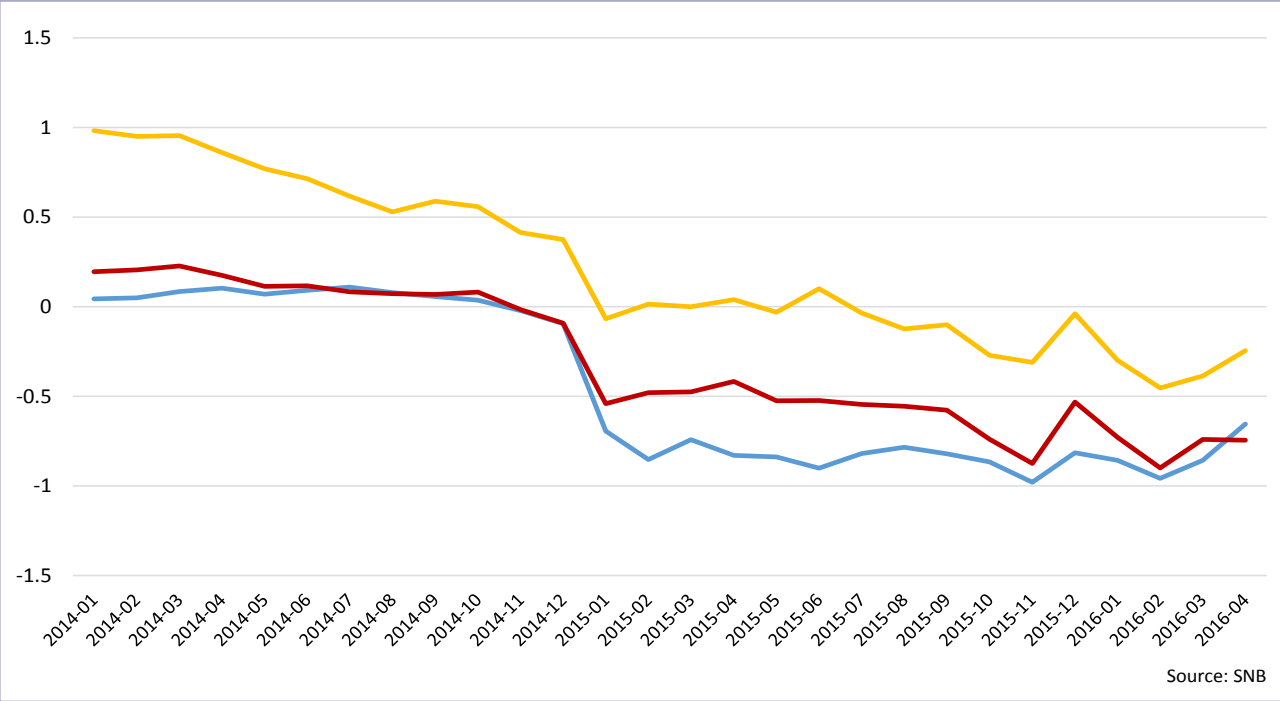


Figure 7 reports observations on borrowing rates in CHF from non-government borrowers around the January 15 decision. These are daily data compiled by the SNB. The impact of the decision to impose negative rates is clearly visible including the overreaction registered in all markets on the day of the decision and the correction observed in the days following. The more solid borrowers, including foreign issuers rated AAA and AA, could borrow at negative rates over a few days in January 2015 and again in December. There are no indications that volumes of issuance were materially affected by the passage to negative rates. But the evidence cannot be viewed as fully conclusive here since only quarterly volume data are available and borrowing rates for these issuers have not been actually negative more than a few days. Quantitatively the impact on corporate borrowing rates are smaller than those observed for government bonds.

Figure 7 - Non-government CHF bonds: spot interest rates
(8 year maturity, spot rates estimated using the extended Nelson/Siegel model)

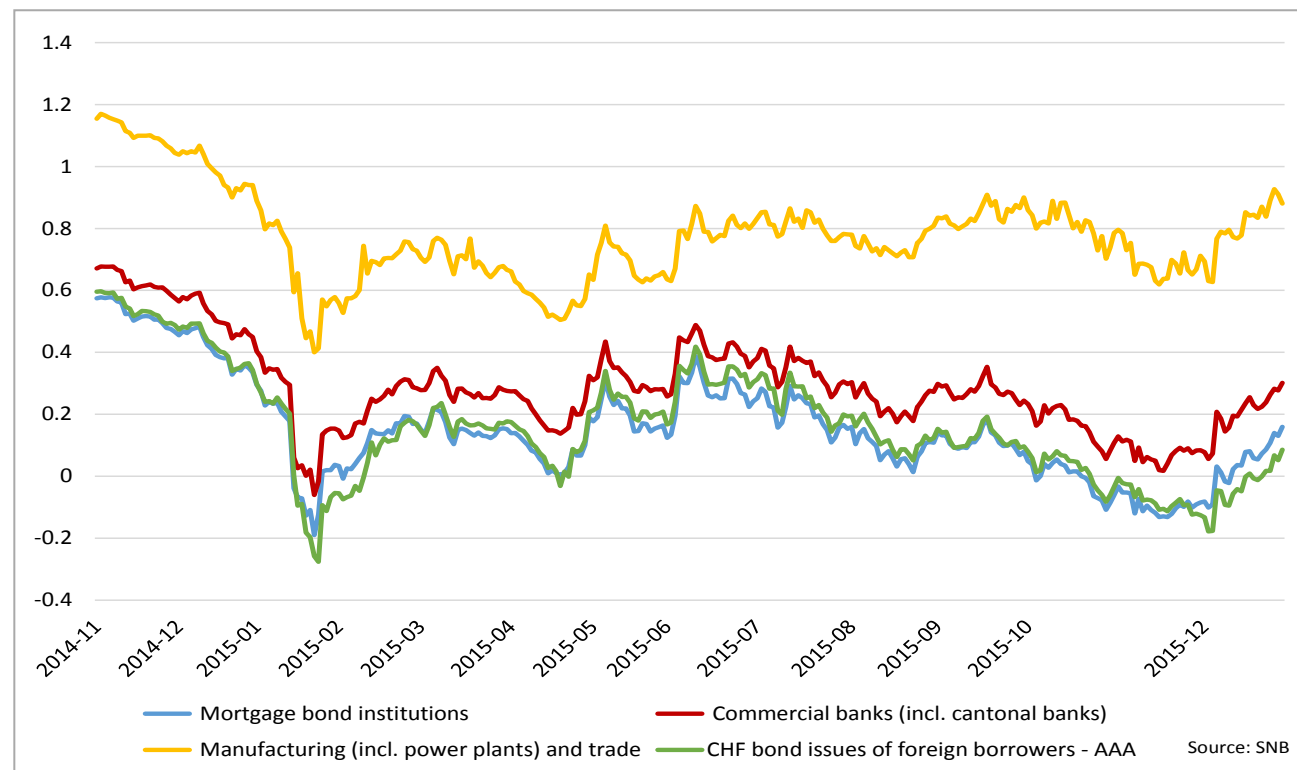
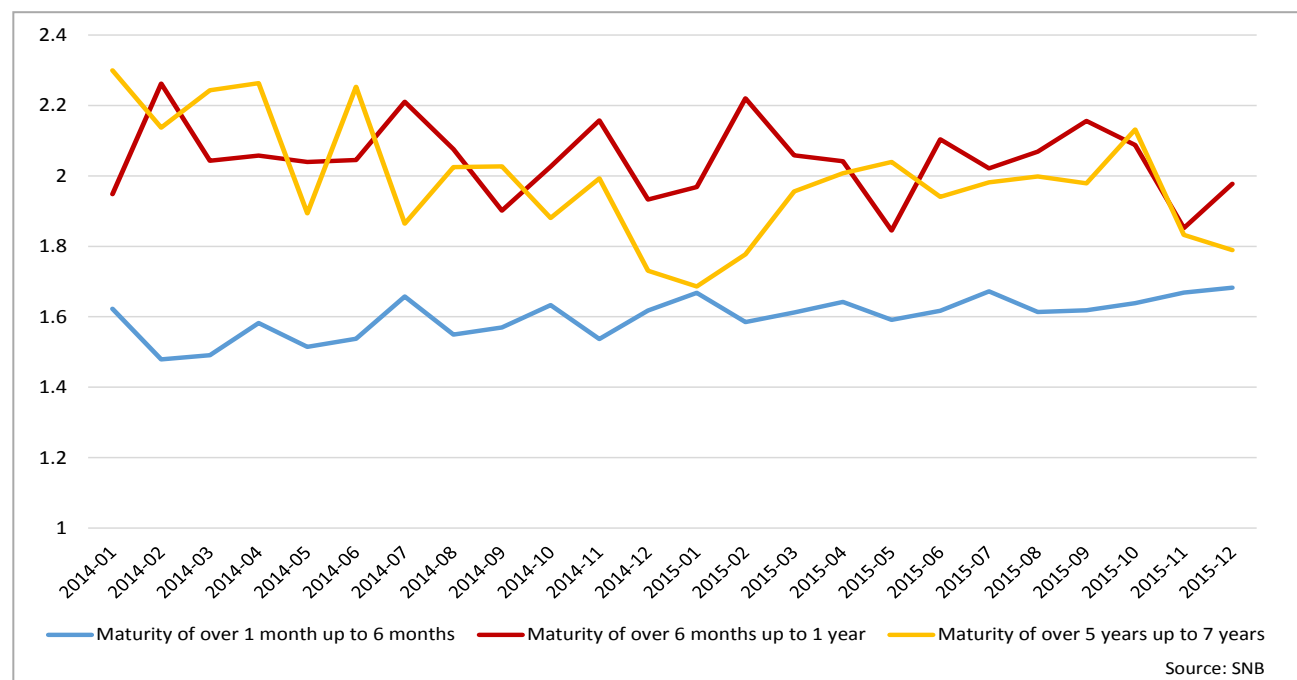
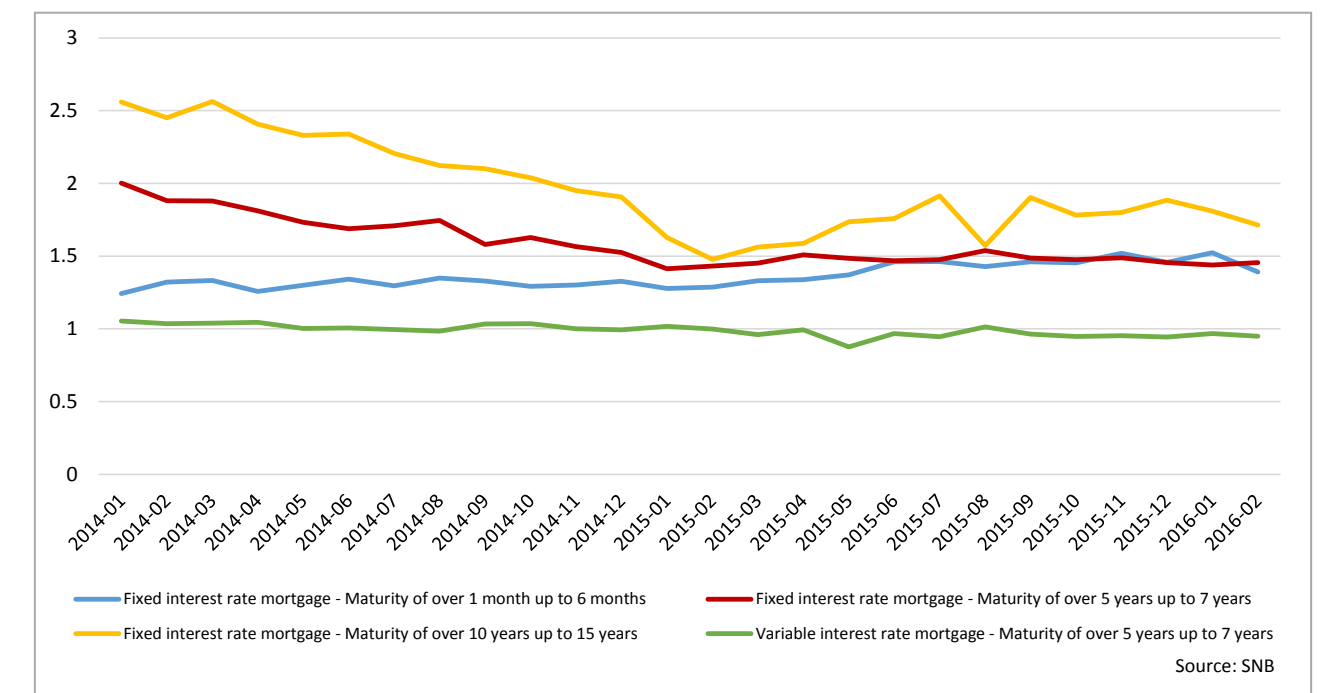


Figure 8 - Swiss bank lending rates
(based on new loans extended to domestic non-financial corporations)



Bank credits. In contrast to the above observations, the evidence suggests the presence of a clear asymmetry when we look at rates on bank credit. Figure 8 suggests that January 15 was close to a non-event for bank credit to corporate customers. Although the first move to negative rates may have initiated a small reaction for longer maturity contracts the move was fully compensated within a period of two months. Short term contracts did not react at all in the predicted direction. Figure 9 reports the evolution of mortgage rates of various maturities. These are highly relevant for the monetary transmission mechanism since mortgages form the bulk of credit volumes in most advanced countries. This is particularly the case in Switzerland. Market mortgage rates have not followed in negative territory and, even more remarkably, they have not even decreased after the introduction of negative interest rates. On the one hand, it is reported that, with a somewhat surprising degree of foresight, banks had preemptively adapted the contracts on variable rate (Libor plus) mortgages and placed a zero rate lower bound in case of the reference Libor moving into negative territory. That is, the revised contract indicated that the variable rate consisted of the max (Libor,0) plus a margin. Moving from a zero Libor to a negative Libor was from this perspective a non-event and accordingly elicited no response from variable rate mortgages. On the other hand, long fixed mortgage rates after a slight decrease following the SNB's decision to go negative reversed the negative trend that had been observed since early 2014 and found themselves at approximately the same level in mid- March 2015 as they were in mid-december 2014, i.e., before the first announcement of negative rates by the SNB. Note that, from the SNB's perspective, this has to be viewed as a piece of good news since a further drop in mortgage rates would not have been warranted given the booming (bubbly?) Swiss real estate market.

Figure 9 - Swiss mortgage interest rates
(based on newly extended mortgage loans)



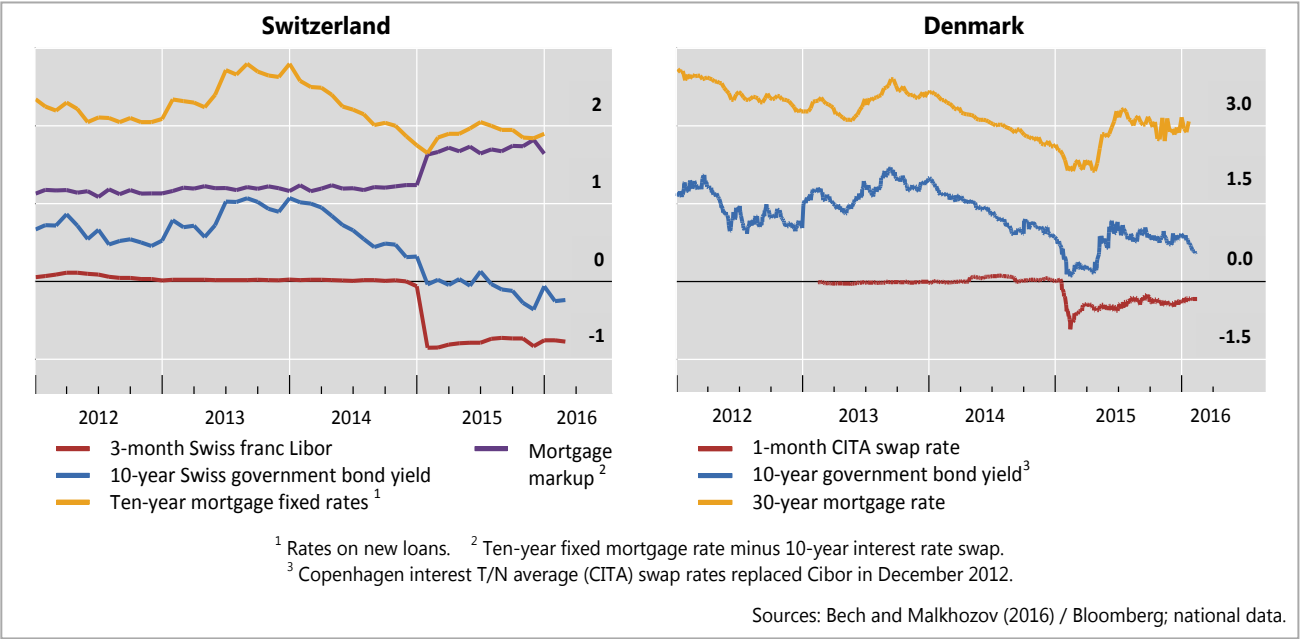
How can we make sense of these observations? The critical element is certainly the reluctance of banks to pass on the negative rates to their retail depositors. With Swiss banks being largely financed with demand deposits (up to 55% of their balance sheet on average), this means that the bulk of their funding is not affected by the move to negative market rates. Banks have logically attempted to protect their profitability and at the minimum they have strived to avoid losing on the asset side what they have not been able to gain on the liability side. Anecdotal evidence indeed confirms that the driver of banks' reactions has been their fear of losing profitable long run client relationships given the perceived resistance to the policy measure by the general public. The fear extends to their corporate clients who also have been spared negative rates even sometimes on large cash deposits but whose credit lines have, for the most part, not benefitted either from the fall, all this taking the form of a delicate day-to-day process of client relationship management. By contrast, the large international banks have ostensibly imposed very negative deposit rates on prospective large cash deposits by new clients while some private wealth managers have a -75bp interest charge for cash deposits above CHF 100'000. On the mortgage front, Brupbacher (2016) indeed credits some "heavy repricing", with mortgage margins having more than doubled (from around 60bp above swap rates to around 150bp), for the reported rise in net interest income by Swiss banks. Such an apparently fragile (to competitive forces) policy move may have been helped by the constant warning of the SNB that the risks in the real estate market were at a very high level and that caution was in order. This may have weakened the resolve of banks to compete on mortgage credit volumes and induced them to 'coordinate' on more restrictive mortgage approval policies.

The comparison between Switzerland and Denmark is highly informative (see Figure 10). In Switzerland, traditional deposit taking banks dominate mortgage credit. By contrast mortgages in Denmark are for the largest part offered by specific institutions that fund themselves in the market. The retail mortgage rate is the market rate augmented by the margin of the intermediary. When market rates fell below zero these institutions naturally passed on the fall to their clients and indeed mortgage rates have adjusted and have sometimes fallen into negative territory. On the other hand, banks financing themselves through client deposits have not transmitted the negative rates to their retail clients but have rather tried to compensate the effectively flattened yield curve by increasing fees and commissions.² And bank lending rates for new loans to non-financial corporations have been reported to have increased in Denmark in 2015.

The Danish experience of course shows the limits of the current Swiss 'equilibrium'. With time, other intermediaries could enter the market and offer negative rate mortgages thus forcing banks to react. The duration and the extent of the negative rates are of the essence here. Domestic Swiss banks can ill afford to lose the mortgage lending business. Were competition from non-banks funding themselves in money and bond markets become hard to bear, banks would have to respond. The temptation to transmit negative rates to retail depositors could then become difficult to resist.

² An increase in bank fees has also been reported in Switzerland.

Figure 10 - Differential pass-through in Switzerland and Denmark

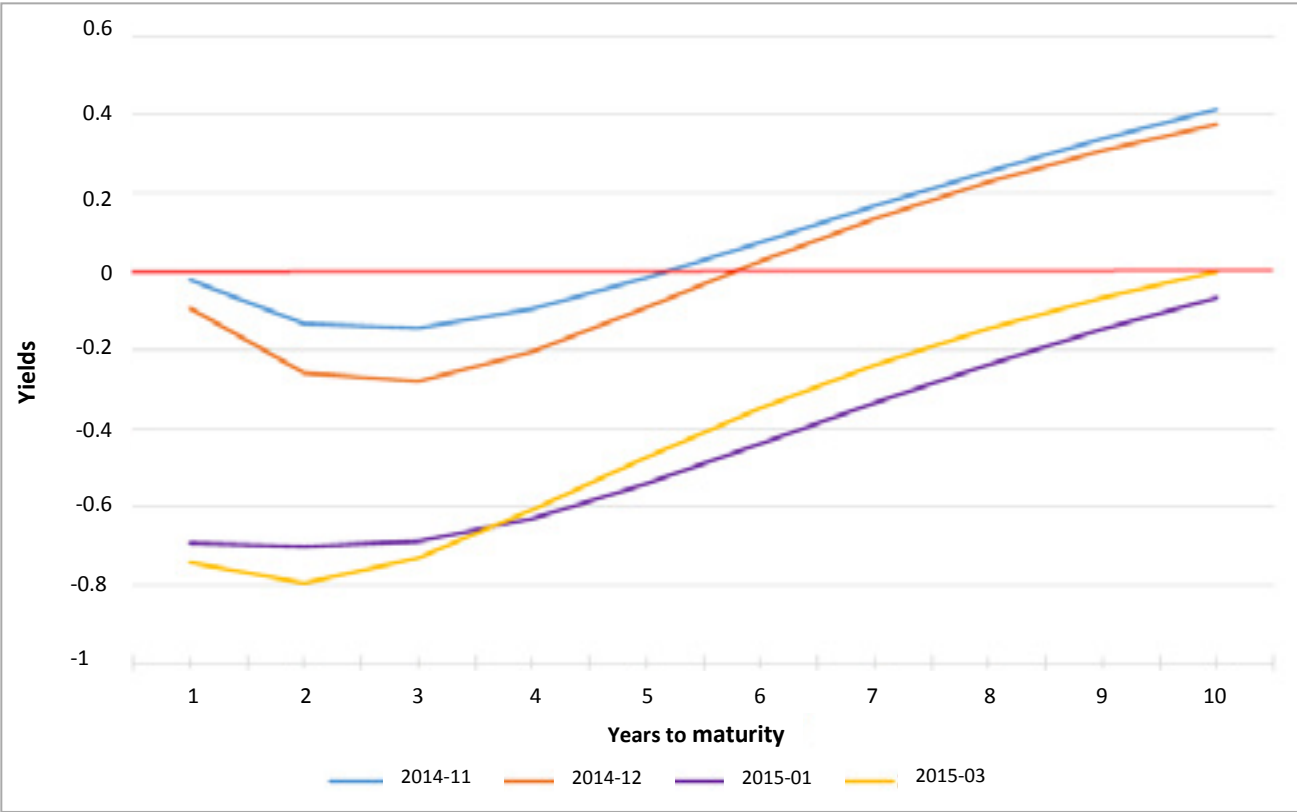


Exchange rates. The most often heard question about negative rates in Switzerland is: "can you demonstrate that they work?" meaning that they indeed help alleviate the pressure on the strong franc. Obviously the answer cannot be categorical. Interest rate differentials are typically the dominant variable in exchange rate equations and there is no evidence that the passage under zero would limit their influence. Indeed one has observed significant effect on capital flows in Denmark and on exchange rates in Sweden and Japan after their move to negative rates but as is typical these moves were not isolated events and other things were going on. The exchange rate impact appears to have been more persistent in Sweden than in Japan while in Denmark the move to negative rate can be interpreted as having been successful in eliminating ER pressures (see Ball et al, 2016). In the Swiss case the simultaneous policy move (the abolition of the ER floor) practically guaranteed a stronger franc and the question is whether the negative rates moderated the appreciation. We lack the counterfactual but all evidence suggest that the typical effect occurred. The drop of 75bp in the policy rate could not make up for the speculative exchange rate gains expected in volatile times and was a small price to pay for an insurance against the risks of a Grexit in the first part of 2015, but in more normal times one expects the rate difference to help the currency settle to a more reasonable level. This appears to have been the case (as of May 2016 the CHF was quoted above 1.10 to the Euro, a level that many would have considered a success for the SNB the day after the abolition of the floor).³ Anecdotal evidence would rather suggest that some categories of investors, at least, do hate negative rates and may react more forcefully to a move from 0 to -75bp than from +75bp to zero. On that score if there is an asymmetry, behavioral biases may cause the aysmmetry to be in favor of a move in negative territory.

³ In its 2015 Annual Report the SNB reports purchases of 86.1 bill. euros in 2015.

Impact on bank profitability. 2015 appears to have been a moderately good year for Swiss banks. The introduction of negative rates has not left a identifiable mark on the profits of the banks. In effect the interest charge has mostly been paid by individual or institutional investors who have been subject to a negative interest by their banks (notably international banks) and by a few wealth managers who have chosen to preserve relationships rather than pass on the negative rate to their clients. For banks, low and lower rates are expected to hurt increasingly as time passes and older contracts are renegotiated. In normal circumstances the slope of the yield curve is the determining factor and the yield curve has become rather steeper (Figure 11). The relevant yield curve must however take account of the fact that rates on deposits have not fallen below zero. As indicated, so far banks have been able to compensate on the asset side of their balance sheet but it cannot be guaranteed that this situation can persist if negative rates were to persist or further decrease. It is also likely that some banks have economized on interest risk hedging given that the policy measure can be interpreted as a signal that rates will stay low for even longer than previously anticipated. This is all the more significant because Swiss clients are increasingly lengthening the maturity of their fixed-rate mortgages. In other negative rate countries it is also reported that bank profitability has not visibly suffered but caution in interpreting the impact over such a short period is equally warranted.

Figure 11 - Swiss yield curve



4. CONCLUSIONS

Despite having spared the general public whose sight deposits have not been affected, negative rates are not popular. The current experiments have brought us close to the limit of negative rates short of taking radical measures such as eradicating paper currency. My take is that the general public is not prepared to vote for such a measure. In a direct democracy this means that the road is blocked until minds change, which may happen but only very slowly. Elsewhere one should be very reluctant to make technocratic choices that lack minimal democratic support. We live dangerously enough in a world of important democratic deficits.

In SOEs where the interest rate is as important for its impact on the ER as it is for its role in determining domestic monetary conditions, a pragmatic approach to more deeply negative rates is conceivable. It consists in imposing fees on wholesale cash withdrawals (or deposits) to prevent wholesale cash hoarding while keeping retail depositors out of it by exempting the largest part of commercial bank reserves. This possibility could be attractive for a country such as Switzerland enabling the SNB to restore a historically normal interest rate differential (notably with respect to the euro) and thus to recover a wider margin of maneuver even in a world of low global rates.

This approach to bypassing the ZLB, however, is not without its limits. First, the current Swiss regime of mortgage credit being intermediated by banks, themselves largely financed through sight deposits, is vulnerable to competitive forces, in particular to the arrival of new entrants offering mortgages with direct market funding. Second, to the extent that negative rates are not passed on to retail deposits, the approach outlined implies an asymmetrical transmission mechanism: banks limit as much as they can the transmission of negative rates on the asset side of their balance sheet, thus precluding a full transmission of the negative rate policy to the real economy. This renders this pragmatic approach to negative rates unattractive to large economic areas in need of a monetary stimulus at the ZLB. For the latter more radical steps are needed if the ELB is to be pushed much lower than current levels.

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