Fiscal implications of monetary policy with negative interest rates

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Abstract:

In recent years, short-term interest rates in the money markets were steered towards zero and beyond by many central banks. While in some countries like Switzerland and Sweden interest rates have been dipping into negative territory, no central bank has dared to go where none had gone before: significantly negative interest rates. The consequences of such a policy are examined in this chapter with a focus on the fiscal implications. Interest rates and bond yields are linked through arbitrage, and negative interest rates are very likely to feed through to the regional and national bond markets.

The effects of government bonds paying interest to the issuer depend on the behaviour in terms of budget consolidation. Local, state and federal governments have different options how to use the funds raised by negative interest rates on their debts. They can use them either to pay down debt, which would leave the real economy mostly unaffected, or they can decide to spend them. The latter would provide a boost to the economy, leading ultimately to more output, more employment and a higher inflation rate. This will itself lead to a higher interest rate in the future, thus steering the interest rate back again into positive territory. It is shown that strategic behaviour matters as governments have an incentive to go with the herd.

The strategic behaviour will largely depend on the question of the possibility of insolvency of the respective government. Where insolvency is no problem, there are

less incentives to rein in spending. Yet, there is at least one large incentive remaining to cut spending in the expectation of higher interest rates, which is the possible increasing net transfer of real resources that a relatively high level of public debt implies. It is important who the counterparts are: the domestic private sector or the external foreign sector, since rising interest rates redistribute purchasing power towards creditors. Therefore, a region with higher than average debt might end up with relatively high net fiscal outflows. This result is undesirable, yet it might not be avoided. This could trigger institutional changes that provide a fiscal mechanism to stabilize lagging regions.

keywords: negative interest rates, monetary policy, fiscal policy

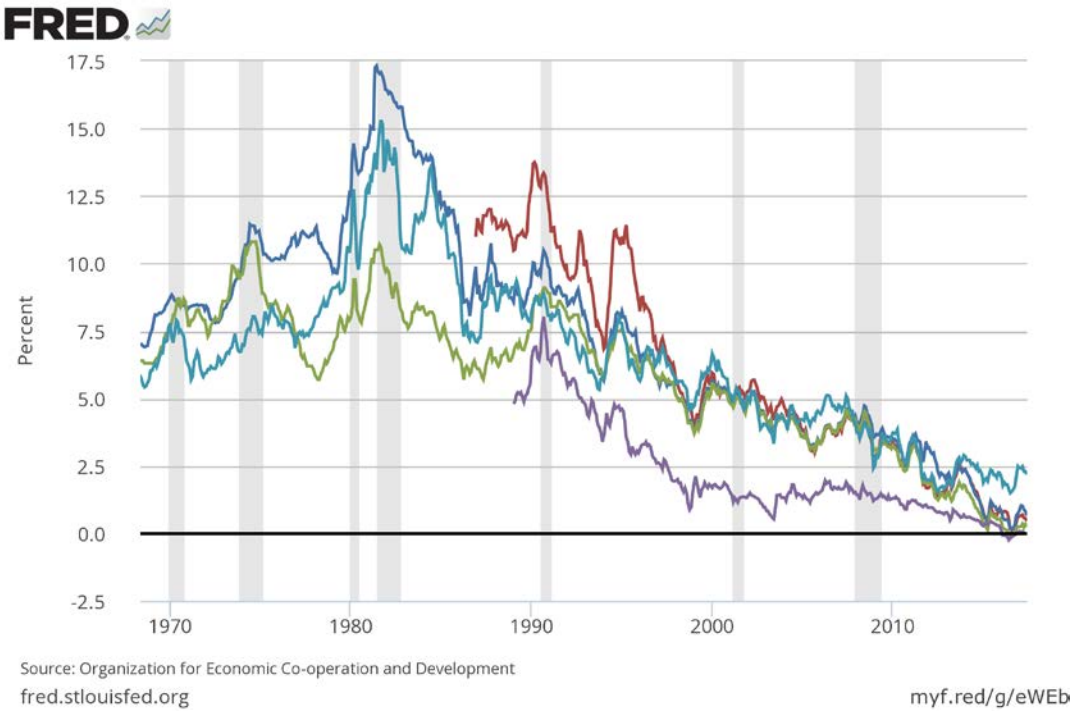
JEL classification: E4, E5, E6

1. Introduction

Over the last decades, interest rates and government bond yields have shown a slow downward trend. By now, interest rates and government bond yields in most developed economies fluctuate in a band between zero and 2.5 per cent. Main interest rates set by central banks have also been negative in some countries, like Sweden (currently -0.5%), Japan (-0.1%), Denmark (-0.65%) or Switzerland (-0.75%).[1] In the Eurozone, the deposit rate is currently in negative territory at -0.4%. Figure 1 shows that in Japan, long-term government bond yields have been negative in late 2016.[2] There is much debate about the causes of the decline of interest rates and the implications of negative interest rates.[3] Summers (2016) blames the low rates on secular stagnation, Piketty (2014) blames lack of demand due to rising inequality.

Figure 1: Long-Term Government Bond Yields, 10-year, main for Sweden (red), France (dark blue), Germany (green), Japan (violet), US (light blue)

[1] This was written in early September 2017.
[2] The Bank of Japan currently has a yield target for 10-year govvernment bonds of 0.00%.
[3] See Cœuré (2016) for a central banker's view. Typically, the word „fiscal" is used rarely – only once in this text, and then not in the context of implications of negative interest rates.



Economists mostly agree that the short-term interest rate is set by the central bank.[4] The deposit and longer-term lending rates are set by the central bank as well. While the monetary side is properly understood, the fiscal side is disputed. Fama (2013, 180) claims that "there is no conclusive evidence (here or elsewhere) on the role of the Fed versus market forces in the long-term path of interest rates." This statement conflicts with the Bank of Japan's (BoJ) program of "Yield Curve Control".[5] "The guideline for market operations specifies a short-term policy interest rate and a target level of a long-term interest rate", writes the BoJ (2016, 1). More specifically, "[t]he Bank will purchase Japanese government bonds (JGBs) so that 10-year JGB yields will remain more or less at the current level (around zero per cent)." These statements, together with the fact that the 10y Japanese government bond yield currently stands at -0.009%, confirm the idea that the central bank can control the yield curve – if it wants to.

[4] Kregel (2014, 4) claims that ‚[m]any critics of ZIRP have argued that the inability to use negative rates is not due to any absolute ZLB, but simply to the unwillingness of central banks to reduce rates below zero'.
[5] See https://www.boj.or.jp/en/mopo/outline/qqe.htm/ for more information.

The relationship between central bank interest rates and bond yields is one of arbitrage. Banks can borrow at the central bank interest rate and invest in long-term government notes, bills and bonds.[6] Since bonds are usually without risk of default, the only risk the banks face is that the central bank interest rates could rise above the interest rate paid on government bonds. Usually, the difference between central bank interest rate and government bond yield is positive, offering a spread to banks. If the spread is negative, banks make losses on their bond holdings. Therefore, a negative spread implies that banks sell off their government bonds to other investors who are willing to pay higher prices for them. This can drive bond yields below zero even when the central bank's interest rates are positive or at zero.[7] The reason why investors are willing to buy government bonds at prices which imply negative yield are manifold. They might be forced to hold government bonds because of regulations, or they might be happy with a certain, but small loss when other assets might be expected to perform even worse. Some investors prefer a sure loss that is small to an unlikely one that is bigger.

Just as with negative interest rates, negative yields turn the functioning of the financial system into something that is quite alien to us.[8] Instead of punishing debtors with an interest rate that they pay on their debt, in a world with negative interest rates (and yields) they are rewarded for their debt by receiving interest rate payments! In the following we will focus on the fiscal dimension of this phenomenon, looking at different levels of government and the consequences that can be expected.[9] In section two the fiscal implications for a sovereign monetary system are examined, in section three, a small fiscal model is developed. The political economy is discussed briefly in

[6] For simplicity, the word bonds will be used in the remainer of the chapter as a shorthand for all debts issued by the national government.
[7] In 2016, this happened to 10y government bonds from Germany in the Eurozone.
[8] See Cechetti (1988) for an acount of negative yields on US liberty bonds during the Great Depression.
[9] See Palley (2016a) for a critique of the zero lower bound and (2016b) for a theoretical critique of negative interest rate policy. See Ilgmann and Menner (2011) for a mainstream view and the link to the ideas of Silvio Gesell. For more on Gesell see Ilgmann (2016).

section four before the focus is moved to the Eurozone and the transfer of real resources in section five. Section six concludes this chapter.

2. Fiscal implications for a sovereign monetary system

In a sovereign monetary system, the national (or federal) government cannot go bankrupt since it is the issuer of money. Often, it is the central bank that issues the currency, while the Treasury issues government bonds. If both institutions work together, the default risk of the government is zero.[10] The central bank can, if it wants to, purchase all government bonds. If it does so, then the Treasury pays interest on the national debt to the central bank. The central bank books interest income as profits, which are returned to the Treasury in most if not all monetary systems.[11] Therefore, negative interest rates are not needed to somehow ensure the solvency of the national government.

The case is different for fiscal debts at the lower levels, like states or municipalities. In the US, for instance, states and municipalities can go bankrupt. Both are usually aiming at balanced budgets. They issue bonds to private investors and are relying on expected tax income being sufficient to pay off or on continued financing by financial markets to roll over their debts. The US municipal bond market, which includes bonds issued by cities and states, is about $3.7 trillion in size in 2017.[12] Gross US federal debt has a market value of $20.3 trillion and a par value of $19.8 trillion.[13] US municipal bonds

[10] See Ehnts (2016, 107-110).
[11] A part of profits is often kept for the rainy day. In the US, the Fed can transfer part of its profits to the capital surplus.
[12] Source: http://www.naic.org/cipr_topics/topic_municipal_bonds.htm
[13] July 2017, source: https://www.dallasfed.org/research/econdata/govdebt#tab3

are less than 20% in size of the federal debts outstanding. They have ratings just as bonds issued by the private sector have. Currently, US municipal bond yields stand like this:[14]

Maturity (and rating)	*yield*
National 10 year (AAA)	*1.85*
National 10 year (AA)	*2.05*
National 10 year (A)	*2.40*

Lower yields translate into lower interest at the time of maturity, when the issuer rolls over its debt by issuing a new bond at a lower rate of interest. The issuer might react to the new interest rate in terms of behaviour. Lower interest rates leave more budget space, and that can be used in different ways. Mostly, the decision is between increasing spending or accepting the relative reduction in debt. Less interest paid shrinks the amount of debt, whereas with negative interest rates the debt will shrink even more if those interest rate payments are used to either pay off maturing bonds or buy up own bonds.

Local governments will face a trade-off. On one hand, paying off debt leaves them less vulnerable to financial markets and increases fiscal space because interest rate payments are reduced. On the other hand, higher spending would not only lead to higher debt, but also to more employment and economic growth, likely also to higher productivity and the provision of more or better public goods. This is the conventional view.

[14] Source: https://www.fmsbonds.com/market-yields/

An unconventional view would consist of seeing interest payments by the public to the private sector as part of deficit-spending, creating incomes for households that these can spend. A fall in interest rates creates effects on the real economy via two channels:

1. Private investment might increase as lower nominal interest rates increase potential profits on any given investment project due to a fall in costs.
2. Private income will definitely decrease as payments of interest from public to private sector will decrease over time. There is a significant time lag since the interest paid depends on the interest fixed when the bonds were drafted, not on the yield.

This insight, well summarized by the following quote from John Maynard Keynes (CW XXVII: 320), referring back to Learner (1943):[15]

> *"I recently read an interesting article by Lerner on deficit budgeting, in which he shows that, in fact, this does not mean an infinite increase in the national debt, since in course of time the interest on the previous debt takes the place of the new debt which would otherwise be required. (He, of course, is thinking of a chronic deficiency of purchasing power rather than an intermittent one.) His argument is impeccable."*

The point made by Lerner is that government spending creates private incomes, and these lead to more private spending. An increase – any increase – in government spending is expansionary because it leads to higher incomes and more demand, inducing businesses to produce more in order to reap higher profits.[16] Government spends by crediting bank accounts of the private sector directly, paying for purchases,

[15] from a letter from John Maynard Keynes to J. E. Meade, referring to Lerner (1943).
[16] This insight, stemming from the Great Depression, unfortunately has been ignored by the proponents of austerity policies.

labour services rendered but also for paying interest on the national debt. From a technical perspective all three channels have the same short-term result. Private income increases, public debt decreases. Since the private sector spends a part of the additional income, the resulting increase in national income is more than just the amount of additional government spending.

Summing up, the rate of interest paid on public debt matters for macroeconomics. It is largely determined by the interest rate set by the central bank because of the arbitrage relationship that banks face with respect to borrowing from the central bank and purchasing (or borrowing or repoing) government bonds. A fall in the rate of interest will decrease income received by the private sector because interest payments from the public sector decrease. A fall in the rate of interest causes a contractionary impulse when it comes to public debt. Usually, economists associate lower interest rates with expansionary monetary policy. Lower interest rates, so it is often assumed, cause investment to rise, which leads to more national income. The net effect is often believed to be clearly positive.

After the Great Financial Crisis, a rethinking of crucial macroeconomic ideas started and one of the interesting issues is the relationship between interest rate and investment.[17] If investment is inelastic with respect to the interest rate, which at times has clearly been the case in most developed economies, then the contractionary effect from lower interest rate payments on public debt will dominate. With negative interest rates, things will be even worse: the holders of government bonds will incur losses on their holdings. Since the private sector – households and firms – have the alternative

[17] See Ehnts and Helmedag (2017) for an overview of mostly monetary issues that deserve more scrutiny.

option of holding cash, they will probably not hold government bonds anymore. Then, who will be willing to hold them?

Banks will still be able to make money holding government bonds since the arbitrage between the central bank's interest rate and government bonds still works. The following table shows some examples. We assume that t-bonds have a maturity of 3 months and that the central bank changes interest rates only every 3 months, coinciding with the dates of debt issuance by the government. In normal times, central bank (CB) interest rates are positive. The first line shows 3% as an example, with the interest rate on t-bonds at 3.1%. Since there is almost no risk in arbitrage, I have assumed a spread of just 0.1%. In times of crisis, like today, CB interest rates are zero (or close to zero). If t-bond interest rates stand at 0.1%, then banks still have a small but positive return on their investment.

CB interest rate	*t-bond interest rate*	*rate of return*
3%	3.1%	0.1%
0%	0.1%	0.1%
-3%	-2.9%	0.1%

Moving into negative territory, banks still find it profitable to finance their acquisitions of t-bonds through central bank loans as the t-bonds can be used as collateral for loans from the central bank. Banks earn 3% interest on these loans they take out if the CB interest rate is -3%.[18] In order to take out that loan they need collateral, and they can get that collateral paying 2.9% as they buy t-bonds. This is a fiscal world that has gone topsy-turvy, where arbitrage still works, but in a strange way: Since now borrowers are

[18] This can only work if excess reserves held by banks are not subject to the deposit rate or if the deposit rate is kept at zero or a positive number.

rewarded, collateral is bought at negative interest rates up to the CB interest rate in order to borrow at an even lower rate.

The fiscal system would hence no come under strain in a world with negative interest rates as borrowers are rewarded financially for their debts. There is no need to worry about selling bonds with negative interest rates into the market as banks will be happy to make a market for them. The next question is what the fiscal authorities would do with the interest they earn. They could either spend it, thus creating higher incomes, or use it to buy back their own debts. Obviously, the macroeconomic effect of the former is expansionary and that of the latter contractionary. What will the fiscal authorities do?

3. A small fiscal model

In order to highlight the consequences of the actions that fiscal authorities take, a small model is presented in a few equations.[19] The economy consists of a public and a private sector.[20] Spending of the public sector is called government spending, spending of the private sector is called consumption. Therefore, GDP equals government spending plus consumption:

$$Y = G + C \qquad (1)$$

Consumption depends on total income of which it is a fraction *c*, plus the transfer of interest caused by ownership of government bonds (public debt):

[19] The model is inspired by Godley and Lavoie (2006), ch. 3.
[20] Banks, even though they hold t-bonds, are ignored here. The spread they earn is small and constant, as we have seen, so this should not matter for the bigger picture.

$$C = c * Y + i * PD \qquad (2a)$$

When interest rates are negative, consumption depends on total income only, since the private sector does not hold bonds anymore:

$$C = c * Y \qquad (2b)$$

Government spending is set exogenously:

$$G = G_0 \qquad (3a)$$

If interest rates are negative, the public sector increases government spending by the interest collected from public debt:

$$G = G_0 + i * PD \qquad (3b)$$

Taxes are collected as income taxes, so that they are a share in total income:

$$T = t * Y \qquad (4)$$

Public debt is accumulated over time by government deficits:

$$PD = PD_{t-1} + G - T \qquad (5a)$$

It is assumed that the propensity to consume is 50% and that the tax rate on income is also 50%. The CB interest rate, which also determines the interest that government pays on its bonds, is set at three different levels: 5% / 0% / -5%. The public debt is assumed to be 100, roughly 200% of GDP in the three scenarios. In scenarios one and two, with a non-zero interest rate, equations (2a) and (3a) are in operation. In scenario three, with a negative interest rate, these are replaced by (2b) and (3b) respectively. This means that the government spends the interest that they receive. If the government decides to use interest payments to reduce their deficit and therefore their public debt, we need to replace equation 5 like this:

$$PD = PD_{t-1} + G - T - i * PD \qquad (5b)$$

Scenario 1: positive interest rate

With a positive interest rate, the small economy is starting with a relatively high level of total income, since interest payments increase consumption of the private sector. This leads to a budget surplus for the public sector, which reduces public debt. Over time, private consumption falls as a consequence of this. In the end, public debt approaches zero and total income falls to forty. This small model delivers a helpful analysis: An economy with national debt and a positive rate of interest should see increased economic activity. This leads to more tax income and thus budget surpluses which over time lead to a fall in national debt, in this case to close to zero.[21]

G	*C*	*PD*	*T*	*(T-G)*	*Y*
20	24,9	97,6	22,4	2,4	44,9

[21] This result, taken from th last row of the following table, is reached after 250 iterations.

20	24,8	95,2	22,4	2,4	44,8
20	24,6	92,9	22,3	2,3	44,6
20	24,5	90,6	22,3	2,3	44,5
…	…	…	…	…	…
20	20,0	0,2	20,0	0,0	40,0

We see that the effect of positive rates of interest on the economy, in the absence of a rise in investment, is contractionary. GDP falls over time until the public debt is zero, which is when the interest rate does not have any influence on GDP anymore.

Scenario 2: zero interest rate

Given the end of scenario one, it should not be a surprise that with interest rates at zero the fiscal stance is basically neutral. GDP is low but stable since consumption is not boosted by additional income from interest paid by the public sector.

G	***C***	***PD***	***T***	***(T-G)***	***Y***
20	20,0	100,0	20,0	0,0	40,0
20	20,0	100,0	20,0	0,0	40,0
20	20,0	100,0	20,0	0,0	40,0
20	20,0	100,0	20,0	0,0	40,0
…	…	…	…	…	…
20	20,0	100,0	20,0	0,0	40,0

With the parameters being what they are, the level of spending creates just the amount of taxes that brings about a government budget that is neutral. However, the level of GDP could be higher, if compared to the first scenario.

Scenario 3: negative interest rate, increased government spending

Introducing a negative interest rate of -5%, we have two options. Either government spends the income whole, or it pays off public debt. The first scenario is treated here, the other in the following scenario. With interest paid on public debt of 100 at 5%, government can increase spending by 5 permanently. This shifts the economy on a higher plateau regarding GDP – it is now constantly at 50 where before it was between 40 and 45.

G	***C***	***PD***	***T***	***(T-G)***	***Y***
25,0	25,0	100,0	25,0	0,0	50,0
25,0	25,0	100,0	25,0	0,0	50,0
25,0	25,0	100,0	25,0	0,0	50,0
25,0	25,0	100,0	25,0	0,0	50,0
…	…	…	…	…	…
25,0	25,0	100,0	25,0	0,0	50,0

If demand deficiency is the problem of an economy, a negative rate of interest with its expansionary effect should work very well. The monetary circuit is refreshed by net injections that ultimately come from the central bank, which is extending loans to banks at negative interest rates, which these use to buy government bonds. The central bank incurs losses. Modern central banks are creators of currency and hence do not have to worry about losses and, as a possible result, negative equity. Some modern central

banks have worked with negative equity for years, others plan to offset current losses by future profits.[22]

Scenario 4: negative interest rate, increased debt repayment

The second possibility for government is to reduce public debt. This has no influence on the real economy as the private sector does not own any government bonds.[23]

G	*C*	*PD*	*T*	*(T-G)*	*Y*
0	0,0	100,0	5,0	5,0	0,0
20,0	20,0	95,2	24,8	4,8	40,0
20,0	20,0	90,7	24,5	4,5	40,0
20,0	20,0	86,4	24,3	4,3	40,0
…	…	…	…	…	…
20,0	20,0	0,0	20,0	0,0	40,0

The economy is thus stable, but the level of GDP is relatively low. Using negative interest rates to reduce public debt is hence not an expansionary policy. This means that negative interest rates are not per se expansionary. As this little model shows, aggregate demand and output will increase depends on the question of what government will do with the interest earnings.

4. The political economy of negative interest rates

[22] See Cincibuch et al. (2010) for the case of the Czech National Bank and Bunea et al. (2016, 11) for the case of possible losses for the European Central Bank.
[23] Bank profits would be diminished, but these are not modelled since they are rather small.

What government will do with interest payments that they receive on their public debt is a difficult question. Ultimately, governments will decide for themselves what to do with the funds that they received. A distinction can be made by looking at the level of government. Local governments, states and municipalities, have relatively low levels of debt, but they do face bankruptcy in case of over-indebtedness. The national government, if indebted in its own currency and supported by the central bank, does not face such a constraint. It can therefore be assumed that the national government might be more willing to spend than local governments. Of course, this depends a lot on what the policy makers, voters and interest groups think about how government spending and government debt work and on what is politically feasible.

Since government spending almost always has spatial spillovers, there is a significant incentive for free-riding on the local government level. Any increase in federal spending will increase local tax income, thus reducing the local deficit or even producing a surplus. On the other hand, a more dynamic view would probably stress the boom and bust character of economic activity, so that it is probably politically wiser to start a new boom than to prepare for the next bust. This is especially so since an increase in government spending by $1 increases GDP by more than $1. Whatever local governments decide, they have an incentive to behave alike since then they could present any resulting financial troubles as systemic problems, demanding more transfers from the federal level.[24]

Another factor is the size of the monetary transfers. In the US, the federal government is much bigger than the state and municipal governments. It has roughly $5 of debt for every single dollar of debt that the latter have. Much, therefore, depends on the central

[24] This is just like bank extending credit and balance sheets in lockstop so as to paint any arising problems as systemic problems that the banks themselves are not to be punished for.

government in the case of the US. Other countries will have other distributions of debts by government, hence all countries must be treated as single cases with their own specificities. A very different animal is the Eurozone, Europe's "many countries – one currency" experiment.

5. Fiscal implications for the Eurozone

In the Eurozone, all governments can at least theoretically go bankrupt. More to the point, they might find themselves cut off from issuing more debt and hence from access to funds needed to pay off maturing debt. This can happen at the local as well as national level, as the case of Greece has shown. Therefore, the fiscal implications of monetary policy with negative interest rates are more difficult to guess than in other monetary systems.

Countries that have above-average national debt might experience strong political pressure to use the additional income to lower their national debt. Given the European narrative that too much government debt caused the crisis this cannot be ruled out even though it would be nonsensical in terms of economic consequences. Also, national debt brakes are giving strong incentives to reduce deficits. At the local level, there is also a lot of pressure from the federal level to reign in spending and use any windfall gains from higher taxation to 'improve the fiscal outlook'.

Given that the last year the average public debt ratio of the Eurozone countries was at around 90% of GDP while the Stability and Growth Pact calls for 60% of GDP, it can be expected that negative interest rates will have few consequences for the Eurozone economy in the short to medium term. Given the memories of the recent past, some

countries might target GDP ratios way below 60%, which would probably take many years, if not decades, to accomplish. Given the political taboo of higher government spending, the only way that the Eurozone can achieve higher growth rates in the foreseeable future is through devaluations of the euro. This, however, would put more pressure on other countries to engage in expansionary economic policy. Trade partners might react by running their own quantitative easing programs in order to fend off the devaluation of the euro, leading to full-blown currency war. Alternatively, trade partners might opt out of trade agreements where possible to limit the free-riding of the Eurozone on foreign demand.

In the context of the Eurozone the net transfer of resources is often highlighted as nations realize that current account imbalances are connected to interconnections of debt. Eurozone countries that have accumulated relatively large debts while having had persistent current account deficits belatedly realize that this combination leads to a potential net transfer of resources to creditor countries. For instance, German and French banks holding Greek government bonds in the years up to 2010 will acquire some of the interest payment of the Greek government. These interest rate payments will not enter the Greek monetary circuit but rather the French or German monetary circuit as the respective banks pay out interest to the ultimate owners of those bonds.

Theoretically, these interest payments are a claim on Greek goods and services that foreigners could purchase. Depending on the interest rate and the spending behaviour of bond holders, government bonds can lead to a change in the net transfer of resources. This is not a priori good or bad. If more foreigners hold Greek bonds, then purchasing power is shifted out of Greece. Foreigners can claim more Greek goods and services than before, but whether they do is not certain. In the last years, Greek bond holders

reacted to the worsening of the fiscal outlook for the Greek government by offloading their holdings and not by using them (indirectly) to buy Greek goods.

Therefore, some regions might prefer to reduce their debt levels in order to stop outflows of interest to foreigners. This will reduce foreigner's net claims on domestic resources. Whether this policy is in the interest of the public is hard to tell. Probably, the way that the Eurozone is set up, creditor countries – those with a current account surplus – are rewarded whereas debtor countries are punished. Whereas the former do not undergo any adjustment, the latter suffer structural adjustment programmes. The fall in wages and prices that result will increase the amount of net resources that creditor countries can ultimately claim. For that to happen, they would need to buy more goods and services from debtor countries. Under the current policy regime in the European Union and specifically in Germany this is somewhat unlikely. Economic policy would have to inflate demand and nominal wages in the creditor countries, and the last years have shown that there is little willingness to engage in such policies.

6. Conclusion

The fiscal implications of monetary policy with negative interest rates are uncertain. There are two possible outcomes. One is expansionary, based on the increase in government spending, the other is neutral, based on decreasing public debt. The expansionary scenario is mildly expansionary in the sense that pushing interest rates below zero slowly will lead to slow adjustment of the economy in terms of output, inflation and unemployment. Tymoigne (2008) writes that some economist argue that negative interest rates will lead to limitless speculation. This outcome is not likely to occur, but when the private sector sells government bonds with negative yields to banks

it has to invest in something else, driving up prices of other financial asset classes, like shares and real estate.

Since negative interest rates are likely to occur when inflation is low or even negative, the danger of debt deflation might arise. Negative interest rates would stop asset prices from falling if the public substitutes bonds for other assets. If, however, the public prefers to hold cash or bank deposits, then financial asset prices might fall across the board, taking with them primary goods prices and hence having a big effect on global trade patters.

Summing up, the fiscal impact of negative interest rates should be manageable for economic policy makers. There are risks with negative interest rates, but not so much in the fiscal parts of the economy. Skidelsky (2016) complained that negative interest rates are unnecessary because the same results – rising government spending – can be reached by standard fiscal measures. This assessment, shared by most Post-Keynesian, looks like a sound one.[25]

[25] See Rochon (2016) and Hein (2017) for an overview,p.

Literature

Bank of Japan (2016), ‚New Framework for Strengthening Monetary Easing: Quantitative and Qualitative Monetary Easing with Yield Curve Control', press release from Sep 21, 2016

Bunea, Daniela, Polychronis Karakitsos, Niall Merriman and Werner Studener (2016), ‚Profit distribution and loss coverage rules for central banks', ECB occasional paper no. 169

Cecchetti, Stephen G. (1988), ‚The Case of the negative nominal interest Rates: New estimates of the term structure of interest rates during the Great Depression', *Journal of Political Economy* **96** (6): pp. 1111-1141

Cincibuch, Martin, Tomas Holub and Jaromir Hurnik (2010), ‚Central Bank Losses and Economic Convergence', *CNB Economic Research Bulletin* **1** (8), pp. 8-11

Cœuré, Benoît (2016), ‚Assessing the implications of negative interest rates', speech at the Yale Financial Crisis Forum, Yale School of Management, New Haven, 28 July 2016

Ehnts, Dirk (2016), *Modern Monetary Theory and European Macroeconomics*, Abingdon, UK: Routledge

Ehnts, Dirk and Fritz Helmedag (2017), ‚The Present State of Economics: Errors and Omissions Excepted', in: Omar Feraboli and Carlo J. Morelli, *Post-Crash Economics:*

Plurality and Heterodox Ideas in Teaching and Research, London: Palgrave Macmillan

Fama, Eugene F. (2013), ‚Does the Fed Control Interest Rates?' *The Review of Asset Pricing Studies* **3** (2), pp. 180-199

Godley, Wynne and Marc Lavoie (2006), *Monetary Economics: An Integrated Approach to Credit, Money, Income, Production and Wealth*, New York: Palgrave Macmillan

Hein, Eckhard (2017), Post-Keynesian Macroeconomics since the mid-1990s – main developments, FMM-Working Paper 1/2017

Ilgmann, Cordelius and Martin Menner (2011), ‚Negative nominal interest rates: history and current proposals', *International Economics and Economic Policy* **8** (4), pp. 383-405

Ilgmann, Cordelius (2016), ‚Silvio Gesell: "A strange, unduly neglected" monetary theorist', *Journal of Post Keynesian Economics* **38** (4), p. 532-564

Keynes, John Maynard (1973), *Collected Writings XXVII: Activities 1940–1946: Shaping the Post-War World: Employment and Commodities*, The Collected Writings of John Maynard Keynes, edited by D. E. Moggridge, London: Macmillan

Kregel, Jan (2014), Liquidity Preference and the entry and exit to ZIRP and QE, Levy Economics Institute of Bard College Policy Note 2014/5

Lerner, Abba (1943), ‚Functional Finance and the Federal Debt', *Social Research* **10** (1), 38-51

Palley, Thomas (2016a), ‚Zero Lower Bound (ZLB) Economics', IMK Working Paper number 164-2016

Palley, Thomas (2016b), ‚Why ZLB Economics and negative interest rate policy (NIRP) are wrong: A theoretical Critique', IMK Working Paper number 172-2016

Piketty, Thomas (2014), *Capital in the Twenty-First Century*, Cambridge, US: The Belknap Press of Harvard University Press

Rochon, Louis-Philippe (2016), In pursuit of the holy grail: monetary policy, the natural rate of interest, and quantitative easing, Studies in Political Economy **97** (1)

Skidelsky, Robert (2016), The case against negative interest rates, The Guardian, 25 May 2016, https://www.theguardian.com/business/2016/may/25/negative-interest-rates-the-case-against-john-maynard-keynes

Summers, Larry (2016), The Age of Secular Stagnation, Foreign Affairs, Mar/Apr, 2-9

Tymoigne, Eric (2008), On the optimality of a permanent zero central-bank rate: Why were central banks created? Paper presented at the 12th FMM Conference in Berlin, https://www.boeckler.de/pdf/v_2008_10_31_tymoigne.pdf