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How to avoid secular stagnation

In this lecture, I deal with the causes and consequences of a relatively recent characteristic of the world economy: the end of capital scarcity. Let me add at the very beginning: I believe this is a phenomenon that is here to stay – unless we should experience another world war which might destroy a lot of real capital.

Here in Vienna let us start with the father of capital theory: Eugen von Böhm-Bawerk. Böhm-Bawerk's theory basically explained the positive real rate of interest by pointing to the scarcity of capital. For Böhm-Bawerk and for us today (and similar to other prices in the economy) the real rate of interest is an indicator of the scarcity of the good for which the rate of interest is the price: real capital. Böhm-Bawerk presented an elaborate argument why capital was scarce and why therefore one needed a positive rate of interest as a rationing device for the use of capital.

It is my proposition that today capital is no longer scarce and that therefore – in the very spirit of Böhm-Bawerk's *opus magnum* the price for capital, i.e. the "natural rate of interest", as Wicksell then designated it, is no longer positive.

Let me be more precise: Böhm-Bawerk and Wicksell had an economy in mind in which the fiscal demand for loans and the fiscal supply of loans was zero. In that hypothetical model world public debt was zero. Only under this assumption did it make sense for Böhm-Bawerk to derive a positive rate of interest from the prevailing scarcity of capital. Thus, following the tradition of capital theory, I also look at the hypothetical situation of capital market equilibrium in an economy with zero net public debt. Obviously, a sufficiently high public indebtedness "crowds out" private investments with a positive rate of return on investment. I come back to this point below.

These days people talk about the reappearance of "secular stagnation". The "end of capital scarcity" can be linked to the fear of secular stagnation. Or to the talk about the "savings glut". My specific angle of analysis to this general discussion is derived from my belief that it is precisely the "Austrian capital theory" which enables us to derive a theoretical underpinning for the hypothesis of the savings glut or the hypothesis of secular stagnation.

1 Demand for capital: There is no upward trend in the capital output ratio

Böhm-Bawerk developed the theory of the productivity advantages of a greater roundaboutness of production. The latter, according to Böhm-Bawerk, is measured by the average period of production. According to him the rate of interest was the price signal for the marginal percentage gain in labour productivity due to a small rise in the period of production. Also, following Böhm-Bawerk, the amount of capital tied to the production process per unit of final output is determined by the average period of production. In essence,

despite the many criticisms of his theory, modern capital theory can show that Böhm-Bawerk's intuition is correct.[2] Indeed, under conditions of steady state growth of an economy one can show that the period of production equals the value ratio between the capital tied down in production and the annual consumption level in this economy. The latter ratio, I designate as the

"capital-output ratio". Traditionally, the capital output ratio is defined as the stock of capital over the flow of annual net national income. The difference between the two magnitudes is not very large in practice. And using the flow of consumption in the denominator enables us to define equilibrium in the capital market by the equality of that capital-output ratio and a corresponding ratio on the supply side of capital.

As we now look at the long range development of the capital output ratio in OECD countries we observe that in the 20th century and the 15 years of the 21st century this ratio did not rise on average. There is no upward trend in the capital output ratio. And this is so despite the fact that financing conditions of real investments have substantially improved in these last 115 years. Just a few examples:

- A much larger fraction of society is able to obtain real estate loans for the purchase of a house or a flat than was the case a century ago.
- The typical price earnings ratios on modern stock markets are much larger than they were a century ago.
- Obtaining equipment like cars or other standardized machinery by means of leasing contracts is much easier today than it was before World War I.
- Real interest rates to be paid by borrowers tend to be lower now than they were, say, in the year 1900.
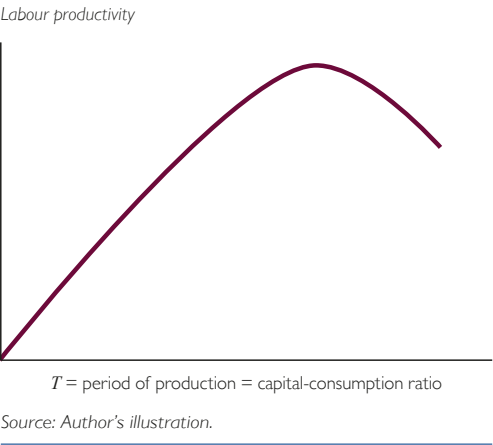
For later reference, I also mention that the capital output ratio in China is not higher than it is in the representative OECD country.

As far as I could find out there is not a single country in the OECD plus China area in which the capital output ratio exceeds six years.

My explanation is this: there is a limit to Böhm-Bawerk's law of greater productivity of greater roundaboutness. Greater roundaboutness of production means a greater degree of com-

Chart 1

The (modernised) Böhm-Bawerk law of greater productivity of greater roundaboutness of production

Labour productivity

T = period of production = capital-consumption ratio

Source: Author's illustration.

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[2]   *On this Weizsäcker (2014).*

plexity of the social production process. No doubt, there are productivity advantages of complexity. For example, as Adam Smith already observed, the division of labour enables a society to obtain higher productivity by orders magnitude. But there are limits for the socially advantageous division of labour. Overspecialization is a well-known phenomenon which is detrimental to productivity. Similarly, from a certain point onwards greater roundaboutness of production no longer generates incremental productivity advantages.[3]
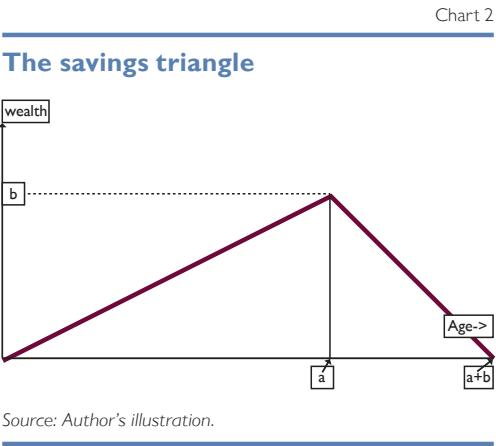
Net of risk premiums and after tax effects real interest rates have been close to zero or below zero for an extended period of time. This is an indication that we have come close to the point of roundaboutness of production which maximises labour productivity. We simply have to follow the Böhm-Bawerkian idea that the rate of interest is a price signal for the marginal productivity of greater roundaboutness.

2 The rising supply of capital: The savings triangle, an eye-opener

In the OECD countries and in China people, on average, enter the labour force at the age of twenty and leave the labour force for retirement at the age of sixty. Their adult life, on average, extends from the age of twenty to the age of eighty. Their retirement life, on average, lasts twenty years: from age sixty to age eighty.

Here, I introduce an analytical device for thinking about the supply of capital in terms of these demographic facts. It is in the spirit of Modigliani's life cycle hypothesis.[4] I call it the "savings triangle". Imagine a person earn-ing a constant level of annual wages for a years, and then expecting to live in retirement for another b years. Ignore interest payments on accumulated wealth. The person wants to distribute her consumption flow evenly across time. We then can draw a picture showing the level of accumulated wealth throughout the life of the person. The total length of the adult life then is $a + b$. Wealth is zero at the beginning of adult life and at its end. In between, it rises linearly for a periods and reaches its maximum at the time of retirement. From then onwards wealth declines linearly until it reaches zero at the end of life. Here, we ignore interest payments on wealth. At its maximum wealth equals the total amount of consumption during the retirement period. The maximum wealth then amounts to b times annual consumption. In chart 2 we draw the "savings triangle". We depict wealth of the person as a function of age, beginning with the biological age 20, which is age zero of adult life. The unit in which we measure wealth is the level of annual consumption. Thus, wealth is measured in time units: so and so many years of annual consumption.

Chart 2

The savings triangle

Source: Author's illustration.

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[3] A more detailed analysis of the limits for socially advantageous roundaboutness of production is contained in Weizsäcker (2015), especially sections 3 and 5.

[4] Modigliani et al. (1954).

This triangle helps us to assess the wealth the person has on average through her adult lifetime. Obviously it is $\frac{b}{2}$ years of consumption. For a stationary population this average wealth through time of one cohort corresponds to the average wealth per head of the total population at a given time. Thus in this stylized economy the wealth/consumption ratio equals $\frac{b}{2}$ years. Given that for the OECD and China the retirement period equals 20 years we infer a wealth/consumption ratio of 10 years.

At first sight the simple model seems to be a rather unrealistic description of the representative consumer and saver. But it is not that unrealistic if we reckon in present value terms. Then, as long as the rate of interest obtained on accumulated wealth equals the rate of growth of annual wages and the rate of growth of annual consumption we are back at our triangle. We simply have to reckon in present value terms.

The savings triangle model leads to a savings ratio out of labour income of one third. The people in the labour force save half as much as they consume because the pension period is half their working period. Their labour income is spread over 40 years, their consumption spreads over 60 years. Hence, one third of their wage income is spent in years in which they do not work, i.e. it is saved for retirement consumption.

And this is to a close approximation what we observe in actual advanced economies with a well-developed social security system. If we add together private savings in the narrow sense of that word, contributions of employees, employers and the government towards the financing of pensions, if we add contributions of the active population to the financing of health costs of pen-

sioners then we arrive at roughly one third of wage income. These are, in a sense, quasi-savings of the active population, because their contributions to the financing of the pensioners are justified by the promise that they later will receive similar social security and health benefits when they are old.

For a more detailed analysis of life cycle savings in this context see Weizsäcker (2014) and Weizsäcker (2015).

On top of saving for retirement there is saving for bequests, in particular for children's inheritance. My estimate for the advanced economies, but also for China, is that the wealth effect of this bequest motive amounts to at least another two years of consumption. Thus, on average people in the OECD plus China region want to hold wealth amounting to at least 12 years of consumption.

This propensity to hold wealth is at least double the amount of real capital which is required for the roundaboutness of production under a zero real rate of interest. I therefore conclude that the natural rate of interest is negative. This means: If it were not for a substantial level of government debt, an excess of saving over investment only could be avoided with a substantially negative real rate of interest.

And indeed, government debt in OECD countries amounts to at least three years of consumption. There is the explicit public debt, which on average over the different OECD members amounts to about one year of consumption. On top of this comes the much larger implicit debt generated by pay-as-you-go social security systems: The government has an obligation to honour the future pension rights of people who have already contributed to the social security system. At least one quarter of wealth held by people is directly and in-

directly held in the form of explicit and implicit public debt.

From the point of view of theory, in particular Austrian theory, it is of some interest that the capital market equilibrium is characterised by the equality of the period of production and the "waiting period". The former stands, as discussed above, for the demand for real capital. The latter stands for the supply of capital. As an example, I use again the savings triangle where I derived that the average wealth per person amounts to $\frac{b}{2}$ times annual consumption. Let me then define the "waiting period" as the average delay of consumption relative to the time the income was earned. The "time point of gravity" of earnings is the middle between age 20 and age 60, i.e. it corresponds to age 40. The "time point of gravity" of consumption is the middle between age 20 and age 80, i.e. it corresponds to age 50. The difference between these two points of gravity can be interpreted as the average "waiting period" between earning and consuming the money. It is not an accident that this waiting period equals the average amount of wealth held by the person throughout her life, if we reckon in the accounting unit "annual consumption". Indeed, it can be shown quite generally that this equality of the waiting period and the period of production is a characteristic of capital market equilibrium of an economy which exhibits steady state growth and which has no public debt.[5] A special case is the stationary economy which corresponds to a growth rate of zero.
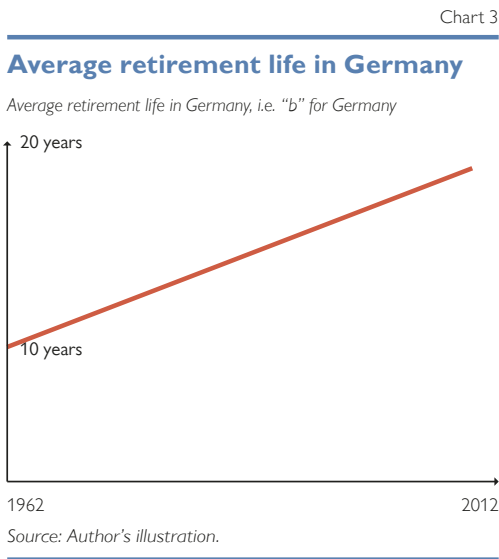
Why is it that many economists and many people in business and politics resist the insight of a negative natural rate of interest? One reason, in my opinion,

is the fact that this negative natural rate of interest is a recent phenomenon. And the very low interest rates are also a new experience. Many analysts believe the rate of interest is so low because the leading central banks make it artificially low. The problem is that – as Wicksell already taught us – a central bank which keeps interest rates artificially low, will experience substantial inflation fairly soon. But neither Japan nor Switzerland have experienced inflation despite the fact that in both countries interest rates have been very low for a long time. The deeper

reason for resistance against the negative natural interest proposition can be seen in the fact that it is a novel experience of humankind. When Böhm-Bawerk developed his scarcity theory of the positive real rate of interest the average pension period in the developed world was less than two years. Saving for retirement was less important than now by an order of magnitude. Böhm-Bawerk's reasons given for an insufficient saving activity were indeed more important than the provision for retirement. But life expectancy has steadily risen in the last hundred years. As chart 3 shows for the case of Germany, within the last half century

[5] *Cf. Weizsäcker (2014).*

Average retirement life in Germany

Average retirement life in Germany, i.e. "b" for Germany

Source: Author's illustration.

the *b* has doubled from 10 years to 20 years.

Moreover, through large parts of that period government debt has risen faster than GDP or annual consumption – and this mainly for reasons which were not of a "Keynesian" nature of insufficient demand. This has kept the real interest rate substantially above its "natural" level – thereby deflecting attention from the steady decline in this natural rate of interest. Only in the 1990s the rapid rise of Chinas role as a net exporter not only of goods, but also of capital lead to the idea of a saving glut. And then only the financial crisis from 2007 onwards lead a small, but growing minority of commentators towards the conclusion that something fundamental and lasting may have changed in the world capitalist system.

If the natural rate of interest remains permanently negative this will have substantial implications for the appropriate institutional set-up of the capitalist world. This is likely to be inconvenient for many vested interests tied up with the prevailing institutions. Thus, it is understandable that there is

strong resistance against this new economic thinking. And let us not forget the final passage of Keynes' General Theory, from which I quote:[6] "the ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed, the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist. Madmen in authority, who hear voices in the air, are distilling their frenzy from some academic scribbler a few years back. I am sure the power of vested interests is vastly exaggerated compared with the gradual encroachment of ideas. Not, indeed, immediately, but after a certain interval; for in the field of economic and political philosophy there are not many who are influenced by new theories after they are twenty-five or thirty years of age, so that the ideas which civil servants and politicians and even agitators apply to current events are not likely to be the newest. But, soon or late, it is ideas, not vested interests, which are dangerous for good or evil."

3 Some policy implications

In the following, I discuss a few policy topics which one can derive from the negative natural interest phenomenon. Obviously, many more implications wait in the wings.

We must distinguish between the "natural real rate of interest" and the "equilibrium real rate of interest". The former is the equilibrium rate of interest which would prevail in a world economy with zero public debt. Let me denote it by $r*$. The actual equilibrium real rate of interest is influenced by the actual fiscal behaviour of the different

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[6] *Keynes (1936).*

states in the OECD plus China region. I denote it by *r*.

Given that we observe a very low level of interest rates I work with the following hypothesis. Let *D* be the "public debt period". By this I mean the ratio between total public debt in the OECD plus China region and the annual flow of consumption in the same region. The hypothesis then is: provided *D* does not rise in the future, the equilibrium real rate of interest will stay at zero or below zero. As before, the real rate of interest *r* is understood net of risk premiums and after tax effects. Thus, *r* is the real rate a government pays in effect on its debt, if the capital market considers it to be free of default risk. Take German "Bunds" of 10-years remaining duration as an example. Its yield these days is 0.6% p.a. Given that the tax payer pays 30% tax on this interest payment the government in effect pays 0.42% p.a. With an inflation rate of 1% p.a. the real rate is −0.58%, i.e. it is negative.

3.1 The "zero-interest fiscal dividend"

If an economy grows at the annual rate *g > 0* then public debt can rise every year at the rate *g* without changing the public debt period *D*. At an interest rate *r = 0* and keeping government expenditures the same, and looking at steady state growth, taxes as a proportion of annual consumption can be lower by *gD* if compared with a government debt of zero. I call this gain for the tax payer the "zero-interest fiscal dividend". This fiscal dividend would be even larger, if the real rate of interest was negative. The zero-interest fiscal dividend is of course a special case of the well-known Domar formula for the steady state requirement of the primary budget surplus. In this case the steady state re-

quirement of the primary budget surplus is –*gD*, if expressed in annual consumption units.[7]

There is an additional "secondary zero-interest fiscal dividend". It is due to the reduction in tax-induced allocation distortions. It is of course well known that taxes distort the price signals of a market economy, and thus they distort the allocation of scarce resources. It is of course difficult to assess the size of the allocation distortion due to taxation. But we know that it is not insubstantial. Moreover, we know that it rises progressively with the level of taxation. Thus, if the burden of distortive taxation can be reduced from, say, 30% (of annual consumption) in the case without public debt to, say, 24%

with *D = 3 years of consumption* and *g = 2% p. a.* then the burden of distortive taxation is reduced by more than one fifth.

If, for example, the tax-induced allocation distortion rises with the square of the level of distortive taxation, if moreover the total loss due to tax-induced allocation distortion amounts to

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[7]   *On the Domar formula consider Holtfrerich et al. (2015), 36–42.*

15% of consumption in the case of a 30% tax burden then the reduction of this tax burden to 24% (due to the zero-interest fiscal dividend) amounts to a reduction of the tax-induced allocation distortion loss from 15% to $\frac{16}{25}15\% = 9.6\%$. This would be a "secondary zero-interest fiscal dividend" of 5.4% of the level of consumption. The total – primary and secondary – zero-interest fiscal dividend would in that numerical example amount to 11.4% of consumption.

Obviously, the zero-interest fiscal dividend cannot be raised at will by raising the public debt period D. The latter can only be raised subject to the constraint that the standing of the debtor in the capital market is not negatively affected.

3.2 Private savings invested at home or invested abroad?

For a decade now Germany has an export surplus which approximately equals the savings (in the conventional definition, thus excluding social security contributions) of private households. Net investment in Germany is lower than aggregate savings by an amount which roughly corresponds to private household savings. Firms exhibit an excess of retained earnings over their net investments which enables them to finance the government deficit.

For the German economy the returns on capital invested abroad are dismally negative. A large fraction went into securities which later defaulted. A number of large banks had to be rescued by the government. Several of them were liquidated.

In the following, I give several reasons why Germany under these circumstances should incur substantial public debt, be it by reducing taxes, be it by raising public investment.

One reason for such a policy is the implicit German guarantee against a collapse of the euro. By raising effective domestic demand in Germany other members of the euro area can raise their exports into Germany and can reduce their imports from Germany. This helps them in their attempt to remain solvent and to convince the capital market that their public debt is not a risky asset. Thus, other things equal, the risk premiums on French, Italian, Spanish public debt declines. These countries pay lower interest rates on their debt, and the likelihood that the German taxpayer has to rescue the public finances in the euro area declines. In a sense, greater explicit public debt of Germany reduces the hidden or implicit public debt of Germany – and this perhaps at a rate so that full (explicit plus implicit) public debt does not even rise in Germany.

Quite generally, in the international context there is an "Invisible Hand Theorem on Public Debt". One half of it is well known in traditional neoclassical economics. If the rate of interest is high on the international capital market, it is to its domestic advantage when a country reduces its public debt or at least reduces its government deficits. At the same time it thereby contributes to a reduction of the interest rates other

countries pay which is to their advantage. But the mirror image of this proposition is also correct: If interest rates are below the rate of growth of a given country then it is in the interest of that country to raise the government deficit and thereby to raise the debt period D. But thereby it also tends to raise its imports and to reduce its exports which in a world of low interest rates is beneficial for the other countries. Generally, we can say that high interest rates signify a "quasi-Barrovian" world.[8] There deficit spending is not advisable. On the other hand low interest rates signify a "quasi-Keynesian" world in which deficit spending is advisable. Since the risk-free rate of interest is a common variable of the international system the invisible hand theorem on public debt prevails. In the "quasi-Barrovian" world debt reduction is advisable for all countries and the benefits of such deficit reduction spread over all countries. In the "quasi-Keynesian" world deficit spending is advisable and the benefits of such deficit spending spread over all countries.

3.3 More growth for Germany due to deficit spending

If demand for goods and services goes up in Germany, and given zero interest rates, so will supply. As at this time skilled labour is a shortage, additional immigration due to good economic conditions should enlarge the skilled labour force. At the same time, if government and private spending goes up due to greater government deficits private investment will also rise, be it in the commercial sector, be it in housing. All this will contribute to economic growth.

No doubt, higher German government deficits can have an inflationary effect in Germany. But at this time higher German inflation contributes to a speedier adjustment of relative prices within the euro area. As the trade balances of the euro members indicate, prices and wages in some of the Mediterranean countries are "too high", whereas they are "too low" in Germany. Correction of these relative prices is quite painful if it occurs only by deflation, as it does these days. This cumbersome correction process could be made shorter and less costly, if there were some more inflation in the prospering northern member states of the euro area.

Indeed, the ECB is committed to the goal of price stability. It cannot be reached, if the adjustment of relative prices only occurs via deflation and not also partly by inflation.

But note that even with some inflation the growth effect and hence aggregate welfare effect of greater public debt is positive for Germany – given that interest on public debt is zero.

3.4 Demography and public debt

Traditional theory tends to justify the substantial German net capital export as an anticipation of a worsening demographic situation due to low birth rates in Germany. For these future times of a society with many pensioners and an insufficient number of people in the labour force one hopes to draw on the wealth which has been accumulated abroad. In other words, one then expects a negative German balance of trade which one can afford due to the high asset ownership outside of Germany.

Is this the best policy for Germany? I doubt it. As long as due to the savings glut the return on capital invested abroad is nil or very low there are

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[8] Cf. Barro 1974. Note that the Ricardo-Barro Theorem only applies in a world with $>g$.

greater returns on domestic public investments which can be financed by incurring public debt. There are obvious deficiencies in the German public infrastructure. They could be removed by debt financed investment in roads, bridges, railway tracks etc.

But beyond that I want to point to the following link between public debt

and demography. In recent work by the Max-Planck-Institute for Demography in Rostock demographers made fertility forecasts based on an international cross-section analysis referring to countries with high living standards.[9] It turns out that within a group of countries with similar standards of living fertility is markedly higher in countries in which gender equality is high than in other countries. I do not go here into a detailed explanation of this finding. We may surmise that in countries where they have a good social standing in society, women do not have to fear substantial career losses when they give birth to children. The "price" of having children then is lower than in countries were women still have to struggle to

find their adequate socio-economic position outside of the family.

In economically advanced countries there are of course ways to spend government money to raise gender equality. One way is to build up facilities like pre-school institutions for small children that help mothers to cope with the dual task of raising children and working in a paid job. Other such forms of encouraging gender equality may also require government money. If the rate of interest is zero for government debt then one of the best investments for the future well-being of the country and its people could be such government expenditure that indirectly leads to higher fertility rates.

3.5 Fighting protectionism

In a world characterised by a savings glut, by a negative natural rate of interest, with the risk of secular stagnation, countries strive to obtain trade surpluses. Thereby, they can deflect the problems of the savings glut to other countries. But going for export surpluses is a zero sum game. The risk is there that such game will be transformed into a game of competitive devaluation or of raising trade barriers.

In the international trade games played under such savings glut circumstances the bargaining position of a country weakens with a rising balance of trade surplus. This indicates that a large export surplus of a country may not be a stable situation even if it theoretically is highly competitive under free trade conditions. The political economy of international trade simply may make large export surpluses unsustainable.

Incurring additional public debt and budget deficits may then be the best answer also from the viewpoint of international trade diplomacy. Not only is it

[9] *Myrskylä et al. (2012).*

a protection device against upcoming trade barriers. It also is a device to discourage other countries to decide for trade barriers in view of import surpluses. And thereby such additional public debt which reduces Germany's export surplus can be a benefit to all, because it contributes toward a stabilisation of a world regime of free trade.

4 Conclusion

In a world of a negative natural rate of interest public debt has to be seen with a different view than in the traditional world with a positive natural rate of interest. Substantial additional research is needed to understand the policy implications of the negative natural rate of interest.

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