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Carl-Ludwig Holtfrerich\*

## Power or Economic Law? Fresh Reflections on ECB Policy

Conventional wisdom says that central banks determine interest rate levels. After all, monetary policy set by central banks directly influences money market conditions. But these conditions are also shaped by other actors such as government, manufacturing businesses, commercial banks and non-bank financial institutions, as well as by monetary developments abroad. In this paper, it is argued that market forces, such as a global saving glut, play a more important role in setting interest rates than central banks.

Eugen von Böhm-Bawerk's classic 1914 article *Macht oder ökonomisches Gesetz?* presented a treatise which, using the wage level as an example, can be summarised as follows: The range of power of private associations such as trade unions and, one might add, public institutions like central banks is quite considerable in the short run;<sup>1</sup> in the long run, however, it strongly shrinks "in favour of what is subjected to economic laws or rather economic logic."<sup>2</sup> The question today is whether it is the European Central Bank's power or rather market forces that determine the level of interest rates, which since the 1990s have been falling and are nowadays very low. The conventional wisdom is that central banks alone control interest rates. I will present evidence that market forces play a more important role.

The ECB's current monetary policy of setting low and even negative interest rates, along with its open-market policy of quantitative easing (QE), have met with strong criticism,

especially in Germany. The German public, journalists and mainstream economists in academia, think tanks and the financial sector have attacked ECB President Mario Draghi for executing these policies. They argue that they will erode private savings and old-age provisions and will lead to bubbles in the equity and real estate markets, to misdirected investments, to liquidity or solvency problems in the financial sector and to even looser fiscal policies in those eurozone countries that already violate the Maastricht criteria. Schnabl goes so far as to argue that Draghi's monetary policy is undermining the economic order of Germany, as devised by Walter Eucken.<sup>3</sup>

It is well known that the German Bundesbank is opposed to Draghi's monetary policy programme. Current Bundesbank President Jens Weidmann and his predecessor Axel Weber have been outvoted in the ECB Governing Council many times, as has the German member of the ECB Executive Board, Jürgen Stark. Indeed, both Weber and Stark resigned in protest in 2011.<sup>4</sup>

Even leading government members, such as former finance minister Wolfgang Schäuble, have labelled Draghi's monetary policy as dangerous and have pushed for a tighter policy since at least spring of 2016.<sup>5</sup> This is

\* This is a slightly revised version of the paper that I presented in the session on "The Future of the Eurozone" at the Annual Conference of the Institute for New Economic Thinking (INET) in Edinburgh, Scotland, 21-23 October 2017.

- 1 E. von Böhm-Bawerk: *Macht oder ökonomisches Gesetz?*, in: *Zeitschrift für Volkswirtschaft, Sozialpolitik und Verwaltung*, Vol. 23, 1914, pp. 205-271. For an early detailed review of Böhm-Bawerk's article, see J. Bonar: *Macht Oder Ökonomisches Gesetz?* by Eugen v. Böhm-Bawerk, in: *The Economic Journal*, Vol. 30, No. 118, 1920, pp. 214-219. Incidentally, Böhm-Bawerk is one of the fathers of modern theories of capital and capital markets.
- 2 My translation of E. Heuss: *Macht oder ökonomisches Gesetz*, in: *Zeitschrift für die gesamte Staatswissenschaft / Journal of Institutional and Theoretical Economics*, Vol. 128, No. 2, 1972, pp. 185-195, here p. 185. Heuss devotes his article to defining what *power* in Böhm-Bawerk's use of the word means in economic, political and social relations.

- 3 G. Schnabl: *Folgen der Geldpolitik. Die EZB unterhöhlt die Grundpfeiler unserer Wirtschaftsordnung*, FOCUS-MONEY online, 4 September 2017, available at [http://www.focus.de/finanzen/experten/folgen-der-geldpolitik-die-ezb-unterhoeht-die-grundpfeiler-unserer-wirtschaftsordnung\\_id\\_7382123.html](http://www.focus.de/finanzen/experten/folgen-der-geldpolitik-die-ezb-unterhoeht-die-grundpfeiler-unserer-wirtschaftsordnung_id_7382123.html).
- 4 P. Müller, C. Pauly, C. Reiermann: *ECB Chief Economist Quits. Jürgen Stark's Resignation Is Setback for Merkel*, Spiegel Online, 12 September 2011, available at <http://www.spiegel.de/international/europe/ecb-chief-economist-quits-juergen-stark-s-resignation-is-setback-for-merkel-a-785668.html>.
- 5 H. Göbel: *Schäuble will höhere Zinsen, Frankfurter Allgemeine Zeitung*, 11 April 2014, available at <http://www.faz.net/aktuell/wirtschaft/wolfgang-schaeuble-kirtisiert-mario-draghis-ebz-geldpolitik-14171118.html>.

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somewhat ironic, as it was the German government that successfully insisted on the ECB's independence from government influence.

Millions of Germans live in fear of the consequences of Draghi's monetary policy, while Draghi has spoken of the "perverse angst" among Germans regarding his policy decisions.<sup>6</sup> The often stoked fear of inflation, even hyperinflation, as a consequence of the ECB's flood of liquidity into money and capital markets has not at all been substantiated by price developments. Increases in the cost-of-living index have remained well below the price-stability target of under – but close to – two per cent p.a. The same is more or less true for Japan and the US. The expansion of the balance sheets of their respective central banks has been even more pronounced than that of the ECB.

The other side of the coin – cheap credit for investment purposes or real-estate finance – is not discussed, and certainly not complained about by those in Germany who make use of and benefit from it. The fall of interest rates has redistributed income from creditors to debtors. Hyperinflation has the same effect, only much more quickly and strongly. The common denominator is uncertainty, presently with regards to future nominal interest rates and in case of hyperinflation with regards to future real interest rates.<sup>7</sup>

According to regular Eurobarometer polls carried out by the European Commission, Germans are much more risk- and debt-averse than citizens of other EU member states with a long tradition in international commerce and trade, namely Italy, Spain, Portugal, France, the Netherlands and England.<sup>8</sup> I consciously speak of England, not of the UK, because Scotland, as part of the latter, is the proverbial land of penny pinchers and savers, not of risk-takers and debtors. Scotland shares with Germany a background of relative poverty, in the German case lasting well into the late 19th century.

As a consequence of the aversion to debt among German individuals, households and – as a reflection of pub-

lic opinion – governments, Germany has long maintained very high savings and very low net investment ratios. As a result, the country has been running current account surpluses since 2002, surpluses which began to rapidly increase in 2004, reaching a record 8.5% of GDP in 2015. This has since tapered off slightly, falling to a still high 8.1% in 2017. These surpluses are a strong impediment to economic recovery processes in euro area deficit countries, and they are a threat to balanced economic development within the eurozone. Germany's high current account surpluses constitute an incentive in deficit countries to cut currency ties with the most competitive eurozone member state and return to a national currency.

There is a strong belief in Germany, as well as in other eurozone countries, in the UK and in the US, that the level of interest rates is determined solely by the decisions made by central banks, as if the ECB or any other central bank could wield absolute power over the conditions in money and capital markets. Markus C. Kerber, a practicing attorney at law and adjunct professor of public finance and economic policy at the Technische Universität Berlin, explicitly called the ECB a "sovereign dictator" in his statement before the German Constitutional Court questioning the constitutionality of the ECB corporate sector purchase programme as an extension of the QE programme.<sup>9</sup>

It is textbook knowledge that the monetary policy set by central banks has direct influence on money market conditions. But these conditions are also shaped by other actors within the domestic economy, such as government, private manufacturing businesses, non-bank financial institutions and commercial banks, as well as by monetary developments abroad. Depending on its fiscal policy, a government can, for example, demand short-term funds from the money market in deficit situations or add to the supply of these funds in surplus situations. If the government is allowed to draw on credit from the central bank and to deposit these funds in commercial banks, it also adds to the supply of money market funds, thus lowering the interest rate. The behaviour of private non-banks also has effects on money-market conditions, e.g. by changing the relationship between the use of cash and deposit

6 D. Roland: Draghi complains of 'perverse angst' among Germans, *The Telegraph*, 30 September 2013, available at <http://www.telegraph.co.uk/finance/economics/10542289/Draghi-complains-of-perverse-angst-among-Germans.html>.

7 See C.-L. Holtfrerich: *The German Inflation 1914-1923. Causes and Effects in International Perspective*, Berlin/New York 1986, Walter de Gruyter, pp. 73-74, pp. 119-120.

8 See C.-L. Holtfrerich et al.: *Government Debt: Causes, Effects and Limits*, Berlin 2016, Berlin-Brandenburg Academy of Sciences and Humanities, p. 12 and p. 85, endnote 6. See also R.C. Koo: *The Escape from Balance Sheet Recession and the QE Trap. A Hazardous Road for the World Economy*, Singapore 2015, Wiley, p. 207.

9 A. Eitel, H. Zschäpitz: *Verfassungsklage gegen den „souveränen Diktator“ EZB*, *Die Welt*, 15 May 2016, available at <https://www.welt.de/finanzen/article155356244/Verfassungsklage-gegen-den-souveraenen-Diktator-EZB.html>. This was not the first complaint that Kerber initiated against ECB policy in Germany's Constitutional Court. In 2005 he founded the small think tank Europolis in Berlin and continues to serve as its director. Europolis lists its ambitions as follows: "The promotion of more competition, ensuring institutionally the stability of currency and prices, promoting the consolidation of public finances, giving priority to the principle of subsidiarity." See <http://www.europolis-online.org/en/about-us/>. It would be interesting to know who is funding Europolis.

money and by changing the term structure of deposit money. Commercial banks have an impact on money-market conditions mainly via their rate of credit expansion or contraction and their decisions on the extent of their liquidity reserves.<sup>10</sup> Last but not least, monetary developments abroad and the short-term capital inflows or outflows they induce can exert a heavy impact on the domestic money market, especially in a fixed exchange rate system. During the Bretton Woods era, restrictive measures by the German Bundesbank, i.e. efforts to increase the money market's interest rate, were at times stifled by massive short-term capital inflows. When this happened, the Bundesbank's monetary policy, which was aimed at stabilising the domestic business cycle, became almost totally powerless, because it was primarily obliged to stabilise the Deutschmark's exchange rate.<sup>11</sup> Instead, fiscal policy took care of the domestic stabilising, in line with the Mundell-Fleming model first presented in 1962.

It also used to be textbook knowledge that central banks have no direct influence on capital market conditions. Instead, it was assumed that arbitrage between short-term funds in the money market and longer-term funds in capital markets would eventually draw the capital market interest rate in the direction of the money market interest rate.

The supply of funds in capital markets does not flow out of the usual money creation of the central bank, except when QE is undertaken. It is rather determined by the volume of savings worldwide. In addition to domestic savings, capital imports or exports determine the supply of funds in domestic capital markets. The demand for such funds comes from all kinds of economic actors and institutions. At times, central banks may be among those who absorb funds from capital markets through their open-market operations. But currently, the ECB's QE programme supplies an unusually big chunk of the funds offered in euro area capital markets – through the end of 2017, the amount was €60 billion per month.<sup>12</sup>

Institutions and sectors of the economy other than the central bank are usually much more active on both the supply and demand side of capital markets. These include the financial sector, the non-financial business sector, private households that supply savings and demand

mortgages and consumer credit, and the government sector, which supplies savings in times of surplus and demands credit in deficit situations.

As with all markets, the price of capital in capital markets – the interest rate – is determined by the intersection of the supply and demand curves. For some borrowers, a risk premium might be added to the basic interest rate. This premium is usually zero for government, though, because its powers of taxation essentially eliminate the possibility of insolvency. The risk premium is low for sound businesses and somewhat higher in the mortgage and consumer credit markets. It is very high in financially and economically weak countries that are in fiscal or financial distress.

The interest rates on offer in capital markets are currently still extremely low, and real interest rates are even negative. The downward trend did not start with the Great Recession of 2007-08, but has been going on since the 1990s.<sup>13</sup> What has happened on the capital market's supply side?

The volume of worldwide saving has increased much more rapidly than worldwide GDP. This resulted mainly from extremely high growth in emerging economies like the BRICS states, where the welfare state is still relatively underdeveloped compared to advanced economies. Middle class citizens now constitute a large and growing portion of society there. They have the means to save and thus to care for their future economic security individually. In China, for example, the national saving-to-GDP ratio has been estimated at 40%, which is significantly higher than the corresponding ratios in advanced economies.<sup>14</sup>

Bernanke labelled these developments on the capital market supply side a "global saving glut".<sup>15</sup> He observed that in the wake of financial crises in various emerging market economies (EMEs) – including Mexico in 1994, East Asia in 1997, Russia in 1998, Brazil in 1999 and Argentina in 2002, – the affected countries no longer drew

10 For this paragraph, I have drawn on O. Issing: Einführung in die Geldtheorie, 11th ed., Munich 1998, Vahlen, pp. 72-84.

11 For more on this, see C.-L. Holtfrerich: Monetary Policy under Fixed Exchange Rates (1948-70), in: Deutsche Bundesbank (ed.): Fifty Years of the Deutsche Mark. Central Bank and the Currency in Germany since 1948, Oxford/New York 1999, Oxford University Press, pp. 307-401, especially pp. 362-390.

12 As of 1 January 2018, the ECB's monthly purchase of bonds was reduced to €30 billion.

13 For statistics covering the seven most important OECD countries since January 2007, see OECD: Long-term interest rates, available at <https://data.oecd.org/interest/long-term-interest-rates.htm>. The data are those on ten-year government bonds.

14 A chart on its development since 1980 is available at [https://www.quandl.com/data/ODA/CHN\\_NGSD\\_NGDP-China-Gross-National-Savings-of-GDP](https://www.quandl.com/data/ODA/CHN_NGSD_NGDP-China-Gross-National-Savings-of-GDP).

15 B.S. Bernanke: The global saving glut and the US current account deficit, Remarks at the Sandridge Lecture, Virginia Association of Economics, Richmond, Virginia, 10 March 2005, available at <http://www.bis.org/review/r050318d.pdf>. For a reassessment in the light of post-financial-crisis developments, see B.S. Bernanke: Why are interest rates so low, part 3: The Global Savings Glut, Brookings, 1 April 2015, available at <https://www.brookings.edu/blog/ben-bernanke/2015/04/01/why-are-interest-rates-so-low-part-3-the-global-savings-glut/>.

on the pool of world saving by importing capital, but instead built up huge “war chests” of foreign exchange reserves. These were used as buffers against potential capital outflows. In addition, the stockpiling of reserves resulted from foreign-exchange interventions, with the aim of keeping exchange rates undervalued and thus promoting export-led growth. Oil-exporting countries also accumulated growing reserves due to the sharp rise in oil prices. In other words, EMEs and oil exporters ran large current account surpluses, an indication that they were exporting big chunks of their domestic saving to the rest of the world.

These capital exports were mainly absorbed by the United States. Bernanke contends that this led to

persistently low longer-term interest rates in the mid-2000s while the Fed was raising short-term rates. Strong capital inflows also pushed up the value of the dollar and helped create the very large US trade deficit of the time, nearly 6 percent of US gross domestic product in 2006.<sup>16</sup>

By way of comparison, the trade deficit had been only 1.5% of GDP in 1996.

A contributor to the saving glut has been the *balance sheet recession*, a theory first used by Koo to explain the post-1990 sluggish development of the Japanese economy.<sup>17</sup> He later made a similar diagnosis for Germany following the collapse of the internet bubble in 2000 and again for the euro area and the US in the aftermath of the Great Recession. A balance sheet recession occurs after bubbles burst. Businesses and consumers then prefer to save and pay off their debts rather than spend and invest, despite very low interest rates. This increases supply and reduces demand in global capital markets, thus driving interest rates down.

A different approach is used by von Weizsäcker to explain the saving glut – and the resulting very low or negative nominal and real interest rates.<sup>18</sup> Taking Böhm-Bawerk’s capital theory and Wicksell’s interest rate theory as points of departure, he focuses on the effects of demographic developments in the ageing OECD countries and in fast-growing China on the supply and demand for capital. In

16 B.S. Bernanke: Why are interest... , op. cit. In late 2006, Ferguson and Schularick coined the term “Chimerica” for the symbiotic relationship between China and the US, i.e. large-scale saving by the Chinese and significant overspending by Americans. See N. Ferguson, M. Schularick: ‘Chimerica’ and the Global Asset Market Boom, in: *International Finance*, Vol. 10, No. 3, 2007, pp. 215-239.

17 R.C. Koo, op. cit.

18 C.C. von Weizsäcker: Public Debt and Price Stability, in: *German Economic Review*, Vol. 15, No. 1, 2013, pp. 42-61.

contrast to Marx and Böhm-Bawerk’s expectations that there would be a secular trend of a perennially rising ratio of capital to output, always resulting in a positive nominal and *natural* real rate of interest, the capital coefficient did not increase during the spectacular economic development that began in the last third of the 19th century; instead, it remained essentially constant. This means that the demand for capital by the production sector of the economy grew in tandem with the level of production, i.e. roughly at the same rate as GDP.

But the supply of capital by saving, i.e. the accumulation of financial wealth, has grown far faster, especially following the integration of formerly or still nominally communist countries, particularly China, into the world economy. The reason is that along with rapidly rising real incomes and living standards, including much improved medical care, life expectancy has also risen dramatically. At the same time, the retirement age has not. At the end of the 19th century in Germany, the average length of time between the age of retirement at 65 years and death was less than two years. In 1970 it was ten years, and in 2010 it was 17 years. Regardless of the form then – whether through the social security system, implicit public debt or the accumulation of private saving – rich societies need private wealth to grow in tandem with this average length of time between the age of retirement and death. This is the only way to maintain citizens’ consumption levels from their working years throughout their retirement.

Because the growth of the supply of capital far outperforms the demand for capital in the production sector of the economy, this turns the *natural* equilibrium real rate of interest – in the Wicksellian sense – negative. This is incompatible with price stability. To ensure price stability, public debt has to exist, and von Weizsäcker argues that curtailing it violates the price stability goal. I would go further and contend that government debt has to fill the gap between the rapidly growing supply of capital and the slower growth of the demand for capital from the production sector and from private households for mortgage and consumer credit.

Another factor that has recently been pointed out is the increasing share of global players at the technological frontier in the service sector. Fels has discussed what the concentration of economic power in the so-called FAANGs (the five most popular and best performing tech stocks in the market, namely Facebook, Apple, Amazon, Netflix and Google) means for capital market supply and demand:

Superstar firms make higher profits, save more than they invest, and pay out a smaller share of their val-

ue added to labor. The rising importance of superstar firms therefore helps to explain key macro phenomena such as the global ex-ante excess of saving over investment, rising income and wealth inequality, and low wage inflation despite falling unemployment (the “flat Phillips curve”), all of which have contributed to the current environment of low natural ( $r$ -star) and actual interest rates, which in turn supports high equity valuations for the superstars.

What could reverse the ascent of superstar firms and thus the decline in  $r$ -star? (1) Protectionist policies that accelerate de-globalization; (2) anti-trust policies that curb superstar firm’s quasi-monopoly profits; and (3) a surge in labor’s bargaining power that leads to significantly higher wage growth for the bulk of the workforce. Neither of these seems particularly likely anytime soon. So superstar firms and super-low natural interest rates are likely here to stay.<sup>19</sup>

Summers pointed to further developments that contribute to the saving glut:

(M)ore stringent capital and collateral requirements in the wake of the financial crisis have increased the demand for safe assets; ... rising inequality increases the average propensity to save; ... *after tax real interest rates* move more than one-for-one with pre-tax real interest rates, increasing the attractiveness of a given pre-tax real interest rate as inflation declines; and ... the increased costs of financial intermediation, associated with the legacy of the crisis, which drives a greater wedge between the returns to savers and the costs for borrowers.<sup>20</sup>

We now take a closer look at the demand side of global capital markets. The five FAANGs are net suppliers of funds here, and just like other businesses in the service sector, they require less capital per unit of output than businesses in the manufacturing sector. A growing volume of this sector’s investment is self-financed instead of debt-financed. Summers pointed out that population growth in developed countries will continue to slow and that “the *relative price of capital goods has declined* reducing the amount of savings that are absorbed to satisfy a given real investment”.<sup>21</sup>

19 J. F. Els: Interest Rates: How Superstar Firms Depress R-Star, PIMCO Insights, 2017, available at <https://www.pimco.com/en-us/insights/economic-and-market-commentary/macro-perspectives/interest-rates-how-superstar-firms-depress-r-star/>.

20 L.H. Summers: Demand Side Secular Stagnation, in: American Economic Review, Vol. 105, No. 5, 2015, pp. 60-65, here p. 62.

21 Ibid.

Similarly, the government sector has reduced its demand for funds from capital markets, especially in Germany, where even the debt financing of public investment outlays has not taken place for at least 15 years.<sup>22</sup> By imposing balanced-budget requirements on other euro area countries, the German government contributed to the reduction of the level of their governments’ capital market demand. Germany’s current account surpluses since 2002 indicate that the lack of domestic capital market demand was somewhat compensated for by demand from other euro area countries and increasingly from abroad.

We now attempt to quantify the funds supplied by the ECB to the euro capital market from the start of its QE programme in March 2015 through the end of 2017. The QE programme consisted of monthly purchases of €60 billion worth of public bonds and bonds of government-owned companies – and from April 2016 to March 2017, the monthly figure was increased to €80 billion. Over the 34 months of the programme’s duration, the ECB added about €2.28 trillion worth of bonds to its portfolio, which had previously had a value of only about €260 billion. It certainly helped to keep bond prices high and thus interest rates low in the euro capital market, not only through the sheer amount of added demand, but also via the signal effect that a central bank’s policy action also entails.

In order to assess the impact of the QE programme on bond prices and interest rates, it is useful to take a look at the total stock of bonds tradable in euro capital markets. According to statistics from the European System of Central Banks, the volume of all tradable bonds – excluding short-term securities, but including bonds in the ECB’s portfolio – at the end of December 2017 was €13.3 trillion, while the volume of public bonds was €7.3 trillion.<sup>23</sup> The average €67.5 billion worth of bonds that the ECB has been buying on a monthly basis is a tiny fraction of tradable euro-denominated bonds – in relation to the first figure only 0.51%, and in relation to the second figure only 0.92%.

The ECB’s average monthly €67.5 billion of bond purchases represent a flow value. Rather than comparing it to the two stock values used in the calculations above, it is more revealing to calculate its size in relation to other flow values, namely the volume of new issues of long-

22 Net public investment in Germany has been negative since 2003, according to data available upon request from the German Federal Statistical Office in Wiesbaden.

23 See Deutsche Bundesbank: Outstanding amounts and transactions of euro-denominated debt securities by country of residence, sector of the issuer and original maturity, available at [http://www.bundesbank.de/Navigation/EN/Statistics/ESCB\\_statistics/Securities\\_issues/eszb\\_table\\_view\\_node.html?statisticid=debt\\_securities&dateSelect=2017-12-01](http://www.bundesbank.de/Navigation/EN/Statistics/ESCB_statistics/Securities_issues/eszb_table_view_node.html?statisticid=debt_securities&dateSelect=2017-12-01).

term euro-denominated securities – both in total, i.e. privately and publicly issued bonds, as well as just the publicly issued bonds. Total new bond issues from the start of the QE programme in March 2015 through December 2017 sum up to €6.35 trillion, and the volume of publicly issued bonds amounts to €2.88 trillion.<sup>24</sup> During the same 34-month period, the ECB's QE purchases averaged €67.5 billion per month, totalling €2.30 trillion. This means that the ECB has absorbed a little more than a third of all new issues of long-term euro-denominated securities and almost 80% of such bonds issued by governments.

Capital market interest rates would thus perhaps be slightly higher without the ECB's QE programme. The ECB, like the central banks in the US and Japan, has been fighting to prevent deflation in order to avoid its disastrous effects on growth and employment. Despite its monetary policy of zero and even negative interest rates, as well as its huge QE programme, it has thus far failed to achieve its price stability goal of an inflation rate under but close to two per cent.

The reason is that money and capital are no longer as scarce as they used to be. Capital supply has been growing strongly, resulting in Bernanke's saving glut. This has caused the marginal productivity of capital – which determines the *natural rate of interest* – to fall significantly. Wicksell coined the term to differentiate it from the money rate of interest set by the banking sector and its lender of last resort, the central bank.<sup>25</sup> Wicksell already came to the conclusion that “the money rate of interest will always follow the level of the natural rate of interest”.<sup>26</sup> Therefore, a central bank's power to determine money rates of interest falls within small temporary margins that are restricted by developments in the supply of saving and the demand for such funds in capital markets in a globalised world.

In conclusion, fiscal authorities, especially in Germany and in countries under German pressure in the euro area, have cut their demand for funding via capital markets. At the same time, demand for such funding from businesses and households has also been shrinking. But the supply of funds seeking investment possibilities has

been expanding strongly thanks to the global growth in saving. If euro area governments had demanded more credit from capital markets to finance their investments in infrastructure, R&D, education and other projects that are likely to pay off in the future, then the market interest rate, i.e. Wicksell's natural rate of interest, would be higher, in tandem with more economic activity, growth and employment. The QE programme, aimed at stimulating these activities by way of supporting a reduction of long-term interest rates, might have been superfluous if governments had expanded rather than curbed their appetite for credit in order to finance an adequate public investment programme. Credit-financed public investment by governments would have been the alternative to the ECB's QE programme.

Restrictive budget rules, like the Maastricht Treaty's three per cent budget deficit and 60% debt ceiling limits, as well as the addition of a balanced budget amendment to the German Basic Law (Constitution) in 2009, have stood in the way of an adequate public investment programme. These rules have been narrow-mindedly devised without regard to the development of a saving glut in capital markets. In contrast to the mantra of balanced budget advocates, the credit financing of public investment is the opposite of a burden on future generations, as long as real interest rates on the public bonds are lower than GDP growth rates. This has been the case in Germany and in most OECD countries for a number of years. Opportunities to care for the welfare of future generations have been and continue to be missed.

A postscript: Quite to my surprise, the Bank for International Settlements (BIS) reported in its quarterly report of December 2017 that the US Fed's restrictive monetary policy measures, namely raising its key interest rate and selling off some of its previously purchased QE bonds in 2017, had backfired. Capital market interest rates for business bonds dropped after the Fed's restrictive measures. The BIS dubbed this the “paradoxical tightening” of monetary policy.<sup>27</sup> This is further confirmation that market forces determine conditions on capital markets more than central banks do.

<sup>24</sup> Ibid., in particular lines 3.2.1, 3.2.5 and 3.2.6.

<sup>25</sup> K. Wicksell: Geldzins und Güterpreise. Eine Studie über die den Tauschwert des Geldes bestimmenden Ursachen, Jena 1898, Gustav Fischer. Myrdal famously extended Wicksell's theory to a monetary theory of the business cycle. For a summary, see P. Pilkington: Gunnar Myrdal's Monetary Equilibrium Theory: A Summarized Version, 12 August 2013, available at <https://fixingtheeconomists.wordpress.com/2013/08/12/gunnar-myrdals-monetary-equilibrium-theory-a-summarized-version/>.

<sup>26</sup> K. Wicksell: Geldzins und Güterpreise, reprint, Munich 2006, FinanzBuch, p. 146. This conclusion is similar to the one that Böhm-Bawerk drew from wage developments in the labour market.

<sup>27</sup> Bank for International Settlements: BIS Quarterly Review. International banking and financial market developments, December 2017, available at [https://www.bis.org/publ/qtrpdf/r\\_qt1712.htm](https://www.bis.org/publ/qtrpdf/r_qt1712.htm). See also M. Frühauf: Was, wenn Zinserhöhungen gar nicht wirken?, Frankfurter Allgemeine Zeitung, 4 December 2017, available at <http://www.faz.net/aktuell/wirtschaft/zinserhoehungen-biz-zweifelt-an-wirkung-15322760.html>.