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The Costs of Zombification in Europe: Why Austrian Economics Fails and the Empirical Findings for Japan are a Misleading Guide

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Abstract

Supporters of the Austrian School of Economics and a number of empirical studies have claimed that the increasing number of "zombie" companies is a supply-side reason for the low growth rates in Europe. Often, these studies cite empirical findings for Japan to justify their claims, and conclude that in order to overcome the stagnation phase, bad investments and thus zombie companies should be eliminated from the production process. However, such creative destruction can only prove beneficial if innovative and highly productive companies replace these zombies under full utilization of resources. We ask whether findings on the zombie problem from empirical studies on Japan can be applied directly to the current European situation. We present facts contradicting the idea that productive companies would not have been able to exploit their growth potential in (southern) Europe, allegedly because they could not have found suitable employees since these were tied up in zombie companies on a massive scale. Even under the false assumption of full employment in Europe, existing empirical work shows that the losses due to zombification are only around 3.6 % of GDP over 10 years. In our calculation, that would be 100 euros per capita and year currently far too little to call for a drastic change in ECB monetary policy towards past long-run average short-term rates.

Keywords: Zombie Companies, Japan, Austrian School of Economics, Schumpeter, Creative Destruction, Monetary Policy, Costs of Zombification of Europe, Balance Sheet Recession, Secular Stagnation

JEL Classification: B25, B53, D24, E22, E24, E52, E 32, E 52, G 23, J 24

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I. Introduction

Supporters of the Austrian School and a number of empirical economists have claimed that the increasing number of "zombie" companies is a supply-side reason for the permanent low growth phase in Europe. They cite findings for Japan to justify these claims. Zombie companies are highly indebted companies whose operating business does not generate sufficient earnings to guarantee the fulfilment of their payment obligations. Starbatty and Stark have demanded that more attention be paid to Austrian Economics in light of the continuing weak economic growth across Europe. Their recipe for overcoming the current post-crisis phase criticizes Keynesian demand management financed by increasing government debt and refers to Schumpeter's *Theory of Economic Development* as a remedy. According to Schumpeter, during a lasting phase of prosperity, exaggerations occur that cause undesirable developments in the overall economic production structure. In the event of an unavoidable economic downturn, such bad investments would have to be eliminated from the production process. The production factors released in this way are necessary raw materials for subsequent phases of prosperity.[1]

In our current post-crisis world, Austrian economists claim that banks around the world have halted the creative destruction that Schumpeter sees as inevitable in an economic downturn, firstly because the commercial banks, some of which are themselves only weakly capitalized, regularly extend loans to zombie companies as they fear the write-downs associated with the expiration of such loans. Secondly, due to the low refinancing costs of the commercial banks given the extremely low central bank interest rates, banks would additionally finance corporate investments, which generate only very low returns.[2] Zombie companies would therefore currently consume resources that would not be available to other, more productive companies. In a nutshell, the extremely expansive monetary policy of the central banks, in conjunction with the commercial banks' credit policy, has been cementing the undesirable developments in the production structure for years and thus reinforcing economic stagnation. However, those who cite Austrian and in particular Schumpeter's explanations for today's economic cycles and continuing weakness of growth in industrialized countries must first address the analytical framework and relevant assumptions of Austrian economics.

[1] *Starbatty* and *Stark* (2016).

[2] See *Schnabl* (2018).

1. Economic Reality and Walrasian Equilibrium

According to Austrian economists such as Hayek and Schumpeter[3], recessions are due to temporary imbalances in the economy after it has moved away from an originally neoclassical Walrasian equilibrium. Looking back on his own work in 1984, Hayek defended this neoclassical framework and specifically his own monetary over-investment theory against critics, in particular Keynes. In Hayek's view, Keynes had completely eliminated the decisive effect of the change in relative prices in his *General Theory* with the assumption that "unused resources of all kinds are available".[4] In Schumpeter's *Theory of Economic Development*, an innovator starting to use new combinations "must draw the necessary means of production from old combinations". Based on his Walrasian equilibrium framework, Schumpeter argued that "the carrying out of new combinations means, therefore, simply the different employment of the economic system`s existing supplies of productive means."[5]

In reality, however, in addition to the existence of innovative and highly productive companies that replace these zombies, full utilization of resources is also necessary. If this is not the case, for example because the decline of the steel industry is not followed by new emerging sectors that take over the released production factors as "input", unemployment rises. If nothing replaces the zombies, economists who demand (supposedly) creative destruction risk permanent stagnation or shrinkage in the affected regions.[6] This conclusion is also implied by Autor et al. in their empirical analysis of the consequences of increasing import competition on employment and wage income in selected US regions. According to these empirical findings, it cannot be considered guaranteed that the decline of companies that have become permanently unprofitable automatically prepares the soil for the emergence and growth of new, productive firms.[7]

In addition, the suggestion of Starbatty and Stark to take a closer look at Austrian economics, in particular Schumpeter, to overcome the aftermath of the last financial crisis also means taking into account Schumpeter's special position among Austrian economists. In Schumpeter's analysis, economic cycles are a real phenomenon and not the result of a corporate credit boom fueled by low interest rates after an increase in money supply. In his book *Business Cycles*, he stressed:

> "The analytic schema presented in this book evidently does not belong to the family of monetary theories of business cycles. […] We define a monetary theory by the criteri-

[3] *Hayek* (1931), *Schumpeter* (1931).
[4] *Hayek* (1984), p. 26.
[5] *Schumpeter* (1934), p. 67 f.
[6] *Harford* (2018).
[7] *Autor* et al. (2013), pp. 2121–68.

on that it looks upon cycles as 'purely monetary phenomena' in the sense that peculiarities of the sphere of money and credit account for their existence and that but for those pecculiarities they would not exist at all. It should be clear by now, and will become still more so later on, that the writer believes those theories to be wrong and, in their practical implications, misleading."[8]

2. *Schumpeter's Analysis of Business Cycles*

In his main work *Business Cycles*, Schumpeter analyzed the economic processes of the capitalist system of his time. As a result, he presented an analytical scheme for business cycles, in which he identified the entrepreneurial dynamics as an exogenous force disturbing a state of equilibrium. Once the entrepreneurial innovation becomes successful and profitable, other entrepreneurs follow it in a swarm to form clusters. Without widespread imitation, no economic upswing would occur. As a result of higher sales expectations in this second wave, production and investments continue to rise, also among companies whose production still depends on old production lines or products. Over the further course of time, pioneering entrepreneurs then increase the economic flow of goods by implementing new combinations. The economy will be transformed further through technical progress (from the ideas of the pioneering entrepreneurs) and, contrary to the Austrian over-investment theory, prices will even fall.[9] In retrospect, it turns out that in the second wave, some companies borrow merely to expand on "old lines" on the basis of false sales and price expectations. As a result, old, inefficient, and now over-indebted companies have to leave the market and a recession occurs. It was precisely this process that Schumpeter later described as "creative destruction" in his 1942 work *Capitalism, Socialism and Democracy*.

In contrast to Starbatty and Stark, such an undesirable development of the macroeconomic production structure is not due to the creation of credit by banks or too-low interest rates, but to the false expectations of companies that continue to use old production technologies or products in a prosperity triggered by exogenous innovations. Contrary to monetary theories of business cycles, overindebtedness is not a result of easy money. The failure of overindebted companies is a real phenomenon, because their productivity cannot compete with the new combinations of innovative entrepreneurs.[10] As a result, the interplay between pioneering entrepreneurs and companies that mistakenly expand production in a period of prosperity with using old methods, and that thus trigger a business cycle is not merely a monetary but indeed a real phenomenon.

[8] *Schumpeter* (1934), p. 142.
[9] *Schumpeter* (1934), p. 147.
[10] *Schumpeter* (2010), p. 147.

Changes in the credit supply are an essential element of the business cycle, but not an explanation for the fact that there are business cycles at all.[11] Banks finance pioneering entrepreneurs, but they do not create these possibilities, nor do they trigger these exogenous new combinations themselves. However, both sides are closely intertwined: without bank loans, innovative entrepreneurs cannot propel the economy out of its stationary state, and without entrepreneurs, there would be no commercial banks.[12]

In the decade prior to the financial crisis, the credit-to-GDP ratio had risen significantly. The ratio in the industrialized countries was approximately 50 % in 1945, approximately 100 % in 1997, and 160 % 10 years later. By that time, deregulation and financial innovations had created an environment in which banks left to themselves had produced too much of the wrong sort of debt. Instead of lending money to businesses to finance new capital, international banks funded the purchase of assets that already existed and above all existing real estate and leveraged financial assets.[13] In the run-up to the financial and economic crisis of 2007, none of the industrialized countries experienced a corporate investment boom, as Hayek described in his business cycle theory in his book *Prices and Production*.[14]

Economists who want to give reasonable policy recommendations to address the aftermath of the last crisis based on Austrian economic theory or empirical research must always take into account the actual capacity utilisation in the economy, in particluar the utilisation rate of an economy's labor force. King describes the phase before the outbreak of the financial and economic crisis as a period of "Great Stability". GDP growth rates were evolving on a sustainable path around the historical average. Inflation rates were low and stable. More production was possible at any time in the run-up to the crisis, without requiring the release of already-tied production factors as modeled in Austrian econonomics.[15]

3. Empirical Zombie Research and the Course of the Investigation

Caballero et al. set an important benchmark in empirical "zombie research". In the middle of Japan's era of long-term stagnation, they examined the impact

[11] *Schumpeter* (1939), p. 142.

[12] See *Schlotmann* (1997), pp. 27–32, and *Schlotmann* (2017) on the role of commercial banking in the modern credit economy.

[13] See *Turner* (2016), pp. 61–73. See also *Schlotmann* (2017) and *Jorda* et al. (2014), who shows that banks had turned primarily into real estate lenders. In 1928, real estate lending averaged about 30 % of all bank lending; by 1970 it had edged up to 35 %; by 2007, it was approaching 60 % in the advanced economies.

[14] *Hayek* (1931).

[15] *King* (2016), pp. 318–319.

of rising zombie shares on investment, employment growth, and total factor productivity of non-Zombie companies and were able to derive effects on the economy as a whole. The researchers looked for a strong growth-inhibiting crowding-out of production factors, which occurs when zombie companies tie up capital and labour at full employment, leaving them unavailable to more productive firms. Caballero et al. made two findings. On the one hand, the Japanese government forced banks with weak equity capital by law to extend loans to companies facing high risks of default. On the other hand, the state had for decades created an environment through numerous regulations and subsidies in which the social reputation, social pressure, and sense of duty of employers led to almost full employment, even during the crisis. It was and is common practice in Japan to provide people with work, even to tolerate excess employment.[16]

Since then, further studies have used the idea, model design, and methodology of Caballero et al. as a reference to gain similar insights for other OECD countries. In particular, the effects of the zombie distribution on nonzombies in individual countries (e. g., *Schivardi* et al. (2017) for Italy; *Gouveia* and *Osterhold* (2018) for Portugal; and in cross-country studies, *McGowan* et al. (2017) for 13 OECD countries, including 10 from the euro area; *Storz* et al. (2017) for five peripheral and two core euro-area countries; and *Banerjee* and *Hofmann* (2018) for 14 OECD countries, including 10 European and six euro-area countries) have been observed. Recently, Goto and Wilbur revisited Japan in an analysis focused exclusively on small and medium entreprises (SMEs). According to their statistical results, it appears that zombie SMEs "may often escape from zombie status through recovery or exit rather than perpetually remaining zombies."[17]

All of the aforementioned studies raise the question of whether findings on the zombie problem identified in Japan can be applied directly to the current European situation. Are obvious parallels, such as a previous real estate bubble and high writedowns at banks followed by bank failures, sufficient to create zombies, which then, as in Japan, tie up workers at almost full employment so that they are not available to the more productive companies? Despite the fact that European unemployment initially fell for an extended period after the introduction of the euro, (southern) Europe has never experienced full utilisation of its labour force up to the present day. The deep crisis also led to massive and very rapid layoffs of Southern European workers. The idea that productive companies would not have been able to exploit their growth potential in Southern Europe in this situation only because they could not find suitable employees, since they were instead tied up in zombie companies on a massive scale, is a bold assertion. The authors therefore ask whether the zombie issue might be

[16] See *Bosse* (2002) and *Caballero* et al. (2008), p. 1972.

[17] *Goto* and *Wilbur* (2019).

used as a pretext to demand a drastic change of ECB monetary policy with intermediate rate hikes towards past long-run average rates and, at the same time, to divert attention from the danger of a long-lasting secular stagnation.

II. Principles

1. Defining a Zombie Company

Caballero et al. then designate a company as a "zombie" if it has benefited from so-called "subsidised loans" granted by the private banking sector. This definition thus directly addresses the problem of an unsound financial sector. For this purpose, a lower interest rate limit was defined as a fixation of the normal interest rate range, whereby zombies have a negative interest rate gap to this limit. According to this definition, the share of capital sunk in zombie companies in Japan's national GDP increased from about 5 % in the early 1990s to just over 15 % at the turn of the millennium and then stagnated at this level for years. In the real estate sector, the construction sector, and the service sector, this share was temporarily even well above 20 %. Before 2000, however, the indicator had already fallen in most sectors.[18]

The OECD study by McGowan et al. links its definition directly to the profitability of a company. Thus, a company can be classified as a zombie if it has an interest coverage ratio of less than 1 over three consecutive years.[19] According to this definition, zombie rates, measured in terms of number, employment, and capital stock, increased in six of nine countries observed between 2007 and 2013. This trend is especially pronounced in Italy, Spain, and Belgium, where the zombie capital share was between around 14 and 19 % in 2013. In Great Britain and France, on the other hand, declining zombie ratios can be observed for all indicators. The zombie share in relation to the overall economic capital stock in these countries was between 6 and 7 % in 2013.[20]

Gouveia and Osterhold follow the OECD criterion in their study, which focuses on Portuguese companies, but also calculate the zombie share with regard to the number of people employed in the respective firms. For 2015, they calculate zombie shares of 15 to 35 % (capital) and 10 to 25 % (employment) for the majority of economic sectors.[21]

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[18] *Caballero* et al. (2008), pp. 1951–1952.

[19] *McGowan* et al. (2017), pp. 16–17. In order to rule out the possibility that initially unprofitable start-ups will also be included, only companies from the age of 10 are taken into account.

[20] *McGowan* et al. (2017), pp. 17–19.

[21] *Gouveia* and *Osterhold* (2018), pp. 14–15.

Banerjee and Hofmann introduce a definition that extends beyond the OECD definition (current profitability) to consider future profitability and thus limit the scope of potential zombie firms (narrow definition). According to this definition, a company is considered to be a zombie if its Tobin's Q[22] for the entire observation period (1987–2016) is below the median of the corresponding economic sector. However, zombie shares are shown here only with regard to the number of firms, not with regard to capital or employment. They grow from less than 2 % (1987) to more than 12 % (2016) according to the OECD definition and from less than 2 % to about 6 % according to the narrow definition.[23]

Even though different definitions exist to measure the zombie phenomenon, it can be stated that the different indicators used correlate significantly with each other.[24] In this respect, they can be regarded as comparable. In view of these figures, it cannot be denied that zombie firms have a structural advantage, at least in southern Europe. However, the European average zombie prevalence is considerably lower than in post-crisis Japan, and it is therefore necessary to examine the severity of the problem. For this purpose, we first look at possible threats to macroeconomic stability from zombie companies.

2. Effects of Zombie Firm Prevalence on Aggregate Production from a Neoclassical Perspective

Is there a strong growth-inhibiting crowding-out of the production factors? Do zombie companies tie up capital and labour which are therefore not available to the more productive companies? And what are the ultimate effects on productivity and growth?

Starting from a typical neoclassical production function $Y = a * K^{\alpha} * L^{\beta}$, growth of an economy slows down when the growth contribution of at least one of the production factors decreases. This means either a reduction in investment to renew and expand capital stock K, in the number or qualification of the labour force L, or in total factor productivity, which represents the unexplained remainder a.

The reasoning behind the contribution by Caballero et al. and the subsequent studies is, in summary, as follows: If production factors are tied up in zombie companies, capital, labour, and technology are not used efficiently and thus no longer achieve their inherent productivity in the long run. A reallocation of resources to profitable enterprises could raise these productivity reserves and fully exploit the growth potential of the economy. Schumpeter's creative destruction

[22] Ratio between market value and net asset value of a company.

[23] The study does not differentiate between the individual countries.

[24] *Gouveia* and *Osterhold* (2018), p. 7.

could unfold freely as soon as unproductive jobs in zombie firms cease to exist and capital tied up there is reduced, while at the same time productive firms hire workers, invest more intensively, and make innovation efforts that revive economic growth. Banerjee and Hofmann estimate that before 2000, zombie companies had significantly reduced their debt levels by 1.5 to 2 % relative to the non-zombies, while after 2000, there was no significant difference between the two types of companies. Similarly, zombie firms sold significantly less assets after 2000 than before 2000 compared to non-zombies. They refer to this as evidence of unproductive capital commitment.[25]

However, this form of argumentation does not take into account the possibility that there may be market phases with persistent imbalances in selected sub-sectors of the entire economy in which certain production factors are "free", i. e., remain unused over longer periods of time. With a high overall utilisation of the production potential, misallocated production factors may certainly have an inhibiting effect on growth, but the degree of utilisation of labour differed significantly between Japan in the late 20th century and Europe in the early 21st century. In this context, we will now first look at Japan's real economic development and economic policy decisions in the wake of the stock market crash of 1990, before going into the euro-area countries in the period around the 2007/08 financial crisis.

III. Zombification by Boom and Bust Cycles

1. A Brief Look at Japan's Recent Economc History

Japan was on its way to becoming the world's largest economy in the 1980s. The innovative strength of large Japanese companies in key sectors such as high-tech, electrical, shipbuilding, and automotive industries resulted in strong foreign demand for products that were both competitive in terms of quality and price. Government subsidies and strategy guidelines strongly supported this development. When the appreciation of the yen in 1985 as a reaction to the overvalued dollar worsened the situation of export-oriented companies, the public sector strengthened the domestic market with high investments. In addition, the Bank of Japan lowered the key interest rate to 2.5 % by 1987.

The subsequent boom on the stock market could only be partly explained by the continuing robust development of the real economy. In addition to increasing the value of internationally competitive sectors it was also the result of speculation by companies in shrinking sectors that tried to offset their losses by means of risky financial assets instead of productive investments in real capital.

[25] *Banerjee* and *Hofmann* (2018), p. 71.

At the same time, real estate also rose substantially in value and could be used as collateral for new loans. In 1989, the Japanese government decided to introduce a general value-added tax (VAT) to cope with the rising national debt, while the central bank tried to counter the overheating of the financial market by raising the key interest rate from 2.5 to 6 % within six months and by restricting the amount of real estate loans.

In fact, the enormous speculative bubble only began to deflate slowly at first. However, when it became known that many companies had unsecured loans on their books, banks restricted lending severely. The house of cards began to collapse, because the subsequent corporate insolvencies again brought banks into existential difficulties, forcing them to write off many receivables. The collapse of the Nikkei index in the aftermath of the financial crash in 1990 totalled around 40 %. Real estate prices also collapsed as companies sought urgently-needed liquidity by selling land and buildings.[26]

The abyss into which the tumbling banks threatened to pull the entire economy was avoided from 1991 onwards by increasingly drastic and unconventional monetary policy measures: initially, the key interest rate was lowered to 0 %. Later, the central bank bought government bonds and index funds on the Nikkei index without any time limit and eventually even implemented negative interest rates. The government was now able to install credit-financed economic stimulus packages at minimal cost and without accepting high risks, so that the dividing line between monetary and fiscal policy became increasingly blurred until it practically no longer existed at all under the "Abenomics" from 2012 on. As a result, a deep recession and, above all, high unemployment were prevented. But to this day, there is still no sign that the private sector is beginning to spend again, even after the massive monetary easing. According to Koo, who developed the concept of balance sheet recession during such recessions, monetary policy is largely ineffective because after the burst of a bubble, large numbers of consumers and corporations pay down debt rather than spend or invest. The consequence is that economic growth slows or even reverses.[27]

2. The Zombie Phenomenon in Japan

The idea that zombie companies emerge in boom times and slow down the productivity of the economy after a financial and economic crisis because they are artificially kept alive by banks – for survival reasons or at the behest of the government has aroused the interest of economic research in the context of the Japanese crisis.

[26] See *Bosse* (2002).

[27] See *Koo* (2014).

Caballero et al. find in their regression results a significantly declining investment rate among Japanese non-zombie companies as a result of an increase in the zombie share in the corresponding economic sector. In addition, they also identify a significant negative effect of the zombie rate on the employment growth of a non-zombie firm.[28] A crowding-out of the production factors by zombie companies was statistically identified here for the first time. On the one hand, there is a tendency for these firms to withhold investment capital from their more productive competitors because of the crisis mechanisms in the financial sector described above. However, the idea that zombies "retain" well-qualified workers who are therefore not used by the better positioned companies can also be reproduced.

But the historically close links within the economy, formerly known as "Japan Inc.", also helped. Even though the companies had been able to operate freely in the private sector and to conduct their operational business since the end of the Second World War, they continued to orient themselves strongly towards the basic economic policy guidelines, especially with regard to foreign trade. In addition to high economic growth, government planners always pursued the strict goal of full employment.[29] The close ties between companies and the state are an expression of hierarchical thinking, which is also increasingly reflected in the relationship between employers and employees. On the one hand, the latter could now trust that their jobs would be preserved even in a serious crisis as the government took every possible measure to prevent the decline of many companies or their financing banks and to safeguard employment.

On the other hand, the companies could be sure of the traditional loyalty of the employees, which was expressed, for example, in voluntary overtime or waivers of leave.[30] As a result, the unemployment rate never rose above 6 %, even during periods of recession, and remained close to natural unemployment. At the same time, a sclerotic labour market, atypical of times of crisis, has emerged, under whose regime the redistribution of labour from non-productive to productive economic units is unlikely. The necessary adjustment mechanisms for a return to a dynamic economy are thus not triggered, and the work of Caballero et al. was able to arrive at corresponding empirical results.[31]

With this knowledge, however, the question now arises as to whether it is correct to proclaim Japan as a warning example for the euro zone.

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[28] *Caballero* et al. (2008), pp. 1967–68.

[29] See *Schlichtmann* (2002).

[30] See *Meurers* (2003), p. 43.

[31] A more detailed discussion and presentation of crowding-out effects and labour market statistics follows below compared to 21st-century Europe.

IV. Europe After the Crisis: Is There a Threat of "Japanization"?

It may be reasonable to compare the Japanese financial bubble with the US real estate bubble that triggered the great financial and economic crisis in the years from 2007 to 2009. Similar to Japan, the United States had an expansive monetary policy that unleashed a self-reinforcing credit boom that drove up real estate prices. The subsequent financial crash spread across the world at lightning speed as countless securitised US house loans were now on the balance sheets of major international banks. Only through massive coordinated countermeasures by governments in the form of rescue packages for distressed banks and economic stimulus packages for weakening companies was it possible to prevent a worldwide depression as in the 1930s. To this day, the ECB has pursued an activist policy of even negative interest rates in order to maintain the stability of the euro zone. Some economists therefore suspect that considerable parts of the European economic area have already been "Japanized".[32] But is this comparison accurate? Are the analogies between the Japan of the late 20th century and the Europe of the early 21st century so strong that zombification in Europe is likely? A brief overview of the results of the research by McGowan et al. (2017), Gouveia and Osterhold (2018) and Banerjee and Hofmann (2018) may help to shed some light here.

1. Crowding-out of the Factor Capital

McGowan et al. find negative statistical significance between the investment rate of non-zombie companies and the zombie share in the corresponding economic sector for companies in 13 OECD countries.[33] This is in line with the reference study by Caballero et al. Using the estimated parameters, they find that a hypothetical reduction of the zombie share to the level of Slovenia (sample minimum) would result in nearly 2.5 % higher investment per year for a non-zombie enterprise in Italy, about 1.7 % in Belgium, and between 0.5 % and 1.5 % in the other countries. Furthermore, assuming that the country-specific zombie share had remained at its 2007 level, non-zombie companies would have invested on average around 2 % more up to 2013. In Spain and Finland, investments would have been 3–4 % higher, in Italy as high as 6 %.[34]

Banerjee and Hofmann also note a significant negative effect of the zombie share on capital growth of non-zombies, but only according to their narrow zombie definition (Tobin's Q) and not according to the OECD definition. This

[32] See, e. g., *Kremer* (2019); *Hoffmann* and *Schnabl* (2018), pp. 3–4.

[33] *McGowan* et al. (2017), pp. 21–22.

[34] *McGowan* et al. (2017), pp. 26–28.

means that capital growth is estimated to fall by 1 % if the zombie ratio rises by 1 %.[35] Gouveia and Osterhold find the negative effect on capital growth of non-zombies via both the zombie capital share and the zombie employment share.[36] They also distinguish between innovative "high performers" on the one hand and "laggards" on the other within the group of profitable companies and come to the conclusion that the former are less affected by this phenomenon than the latter.[37]

The crowding-out of capital by zombie companies is a phenomenon that has been identified across different countries and time periods and therefore appears to occur with relative consistency. Both initial scenarios—the Japanese financial crisis and the US real estate crisis, with their global consequences and the simultaneous real estate bubble in some southern European countries—are similar: massive deleveraging and the resulting credit crunch put numerous banks in financial distress and thus also drastically reduced lending to companies outside the financial sector. They faced strong competition for a scarce supply of credit. It is likely that banks will prefer to secure their existence in this situation by extending loans to zombie companies with which they have a long-term business relationship rather than, for example, providing venture capital to small, ambitious start-ups.

In addition, McGowan et al. stated that the zombie share correlates positively with company size and age.[38] Small and medium enterprises (SMEs) are generally not publicly listed, are more dependent on bank financing, and are more leveraged, meaning that they pay much higher interest rates. Large multinational corporations, on the other hand, often finance themselves directly through the financial market, e. g., via the bond market, and are regularly rated by rating agencies. This makes it easier for investors to identify zombie risks and makes evergreen lending via the bond market for such companies highly unlikely. In an uncertain financial situation, such firms may, however, benefit more from the overall effects of expansive monetary policy than SMEs. As large capitalization firms, they are used to borrowing in the corporate bond markets, and no bank balance sheet is used for long-term funding. Multinational zombies go bankrupt, are taken over by competitors, or continue to exist in extreme cases when state industrial policy intervenes to secure employment.

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[35] *Banerjee* and *Hofmann* (2018), pp. 75–76.

[36] *Gouveia* and *Osterhold* (2018), p. 16.

[37] *Gouveia* and *Osterhold* (2018), p. 21.

[38] *McGowan* et al. (2017), p. 16. See also *Goto* and *Wilbur* (2019). According to their statistical results it appears that Japanese zombie SMEs "may often escape from zombie status through recovery or exit rather than perpetually remaining zombies."

2. *Crowding-out of the Factor Labor*

A significant influence of the zombie share on employment growth of non-zombie companies in Europe has only been demonstrated with some limitations: McGowan et al. report only weak significance for the total sample of 13 OECD countries, but increased significance in the sub-sample of nine countries with richer data.[39] Using the estimated parameters, they find that a hypothetical reduction of zombie shares to the value of the sample minimum would have resulted in annual employment growth of between 0.1 % and 0.7 % for non-zombie companies. Furthermore, assuming that the country-specific zombie share had remained at its 2007 level, non-zombie companies would have employed an average of 0.5 % more workers up to 2013. Again, Italy would have recorded the highest estimated increase at about 0.8 %.[40] The study by Gouveia and Osterhold does not show any significance of an increase in the zombie share affecting the employment growth of non-zombie firms.[41] Banerjee and Hofmann are able to identify this negative significant statistical relationship, but only according to their narrow zombie definition. Accordingly, they estimate employment growth to fall by 0.26 % if the zombie share rises by 1 %.[42]

The evidence of crowding-out by zombies is considerably smaller for labour than for capital. The significance of the results varies from study to study. In the OECD study, there is significance, but the hypothetical employment losses were much smaller than the estimated investment losses. Banerjee and Hofmann, who find a statistically significant correlation, only do so according to their narrow definition, according to which the average zombie share is only about 6 %.

3. *What Are the Macroeconomic Costs of Zombie Companies?*

So far, we have dealt with the identification of hypothetical investment and employment losses within economic sectors. We have found that there may well be a misallocation of capital in European companies, while the misallocation of labour is much more difficult to prove. It is therefore surprising that in a study by Borio et al. on the economic costs of the zombie problem in 2015, the unfavourable distribution of labour is considered to be the central reason. In an overall analysis of the financial cycles, the authors attempt to examine the intrasectoral misallocations of an economy in particular.

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[39] *McGowan* et al. (2017), pp. 21–22.
[40] *McGowan* et al. (2017), pp. 26–28.
[41] *Gouveia* and *Osterhold* (2018), p. 17.
[42] *Banerjee* and *Hofmann* (2018), pp. 75–76.

Their reasoning can be summarized as follows: In the first phase of the cycle, a credit boom will primarily expand the unproductive sectors of an economy (real estate, construction, finance) and pull workers away from the productive sectors (especially manufacturing). The construction boom in Portugal and Spain was, according to the authors, a real example of this process. According to their first regression series, general labour productivity would then already fall in such boom phases, and this would be due significantly to the misallocation of production factors.[43] The authors also found evidence that 90 % of these misallocations during a credit boom were due to shifts in employment into unproductive sectors and not to productivity losses in sectors with high employment growth.[44]

After the end of the boom and with the bursting of the credit bubble, the authors continue, the subsequent contractions in the second cycle phase did not ensure quickly enough that the necessary reallocation of the labour force back to the more productive sectors would take place. On the contrary, the misallocation of labour due to the already described cause-and-effect relationships between weakened banks and staggering companies persisted for years to come, creating even larger productivity slumps.

In order to demonstrate a concrete extent of the problem of misallocation, Borio et al. investigated recessions with and without aggravating financial crashes and identified standardized cycles and their impact on productivity. For an average boom year, they calculate a productivity loss from misallocations of about 0.15 %. For an average post-crisis year, they calculate a loss of just under 0.4 %.[45]

If one uses the average values determined for the real growth figures of the 12 founding euro-area countries in the five years before and after the Great Financial Crisis (including the two main crisis years 2008 and 2009), the picture presented in Figure 1 is as follows: between 2003 and 2014, these 12 economies would have experienced hypothetical growth of 14.06 % between 2003 and 2014 without zombie companies, instead of the actual growth of 10.46 %. According to model calculations, 3.6 percentage points would have been lost over the entire period, corresponding to about € 387 billion or about € 100 per capita and year. This is not an irrelevant loss, but it does not make the existence of zombie companies a dramatic threat to European prosperity.

On the basis of the results of their regression model, Borio et al. repeatedly make the following policy recommendation: an expansive monetary policy that has led to credit bubbles and a subsequent financial crisis and has supported zombie financing is not a suitable means of bringing the eurozone back on a

[43] *Borio* et al. (2015), p. 10.

[44] *Borio* et al. (2015), pp. 12–13.

[45] *Borio* et al. (2015), pp. 14–15.

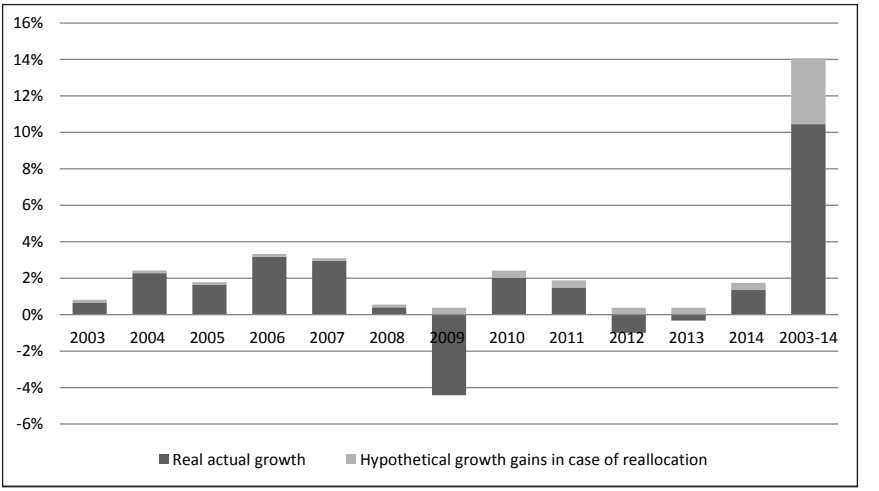

Figure 1: Hypothetical Average Growth Gains in the 12 Founding Euro Area Countries Assuming Reallocation of the Labour Force[46]

long-term growth path.[47] In their opinion, low interest rates would, for example, have prevented the Spanish construction industry from shedding workers after the bursting of the bubble to use them as inputs in other sectors for subsequent phases of prosperity.[48]

Unfortunately, Borio does not ask whether the empiricism of the model corresponds with the economic reality. We attempt to address this question in the following. It is not unlikely that his recommendation for higher interest rates could lead to weaker growth and real costs in economic reality, while growth gains without zombies in his world would remain hypothetical model gains.

4. Reflecting the Estimated Results

Borio's model calculations show averages from 80 recessions in 21 OECD countries, from which general trends but no concrete policy recommendations can be derived. The specific historical economic data in the relevant countries and time periods provide a differentiated picture, especially with regard to labour markets.

[46] Own calculations based on the estimations of *Borio* et al. (2015).

[47] See *Borio* et al. (2015), p. 26.

[48] See *Borio* (2018), p. 6.

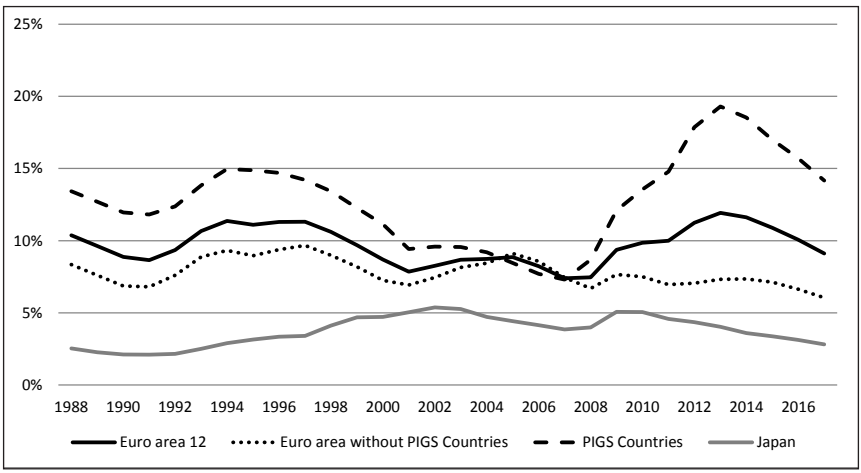

Figure 2: Unemployment Rates in Japan and the Founding States of the Euro Zone from 1988 to 2017[49]

A closer look reveals that the circumstances surrounding the Japanese financial crisis do not coincide with the European crisis after 2009. Similarities exist only in the erosion of the banking sector and its impact on the supply of capital, but the evidence for labour is completely different: In Japan, the unemployment rate has always been exceptionally low when compared globally, as Figure 2 shows. Prior to 1995, the unemployment rate remained below 3 % of the labour force for decades, and it never exceeded 6 %, even in the midst of permanent stagnation. In the group of 12 European countries that have been part of the monetary union since its beginning, the unemployment rate never fell below 7 %, even during the boom years after 2000. Between 1993 and 1998, and between 2011 and 2016, the unemployment rate was even in the double-digit range. Not only the average is important, but also the differences between individual countries. Figure 2 also shows that the Northern and Central European countries[50] had to cope with only a moderate increase during the euro crisis, while unemployment in the PIGS countries[51] was at a worryingly high level for years.

While youth unemployment (Figure 3) peaked at 10.2 % in Japan in 2003 and has since fallen to pre-crisis levels of below 5 %, it has always been between 15 and 25 % in the euro area since 1988. On the one hand, in countries like Germa-

[49] Own calcluations based on data from www.stats.oecd.org.

[50] This includes Austria, Belgium, Finland, France, Germany, the Republic of Ireland, Luxembourg, and the Netherlands. Luxembourg is not included until 1998.

[51] Portugal, Italy, Greece and Spain.

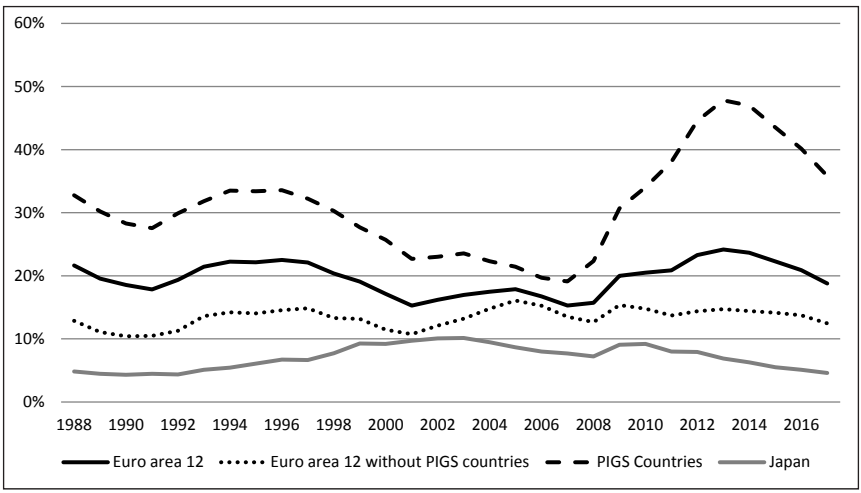

Figure 3: Unemployment Rate of 15 to 24-Year-Olds in Japan, France, Germany and the GIPS Countries[52]

ny, Austria, and the Netherlands it did not exceed the 12 % mark, even in the midst of the euro crisis. On the other hand, it reached a maximum of 42.7 % in Italy (2014), 55.5 % in Spain (2013), and 58.3 % in Greece (2013). In 2017, the youth unemployment rate was still above 30 % within the PIGS country group.

The labour force participation rate remained almost unchanged across Europe over the same period (Figure 4). Even in Greece and Spain, it fell by only around 1.5 percentage points between 2010 and 2017, and in Italy it even rose by around 1.6 percentage points. Thus, the European labour force's efforts to find jobs do not seem to have diminished significantly. At the same time, the significance of the Japanese unemployment figures needs to be put into perspective somewhat, as the labour participation rate there fell by 5 percentage points in the 20 years after 1992 and rose again afterwards.

Beyond the analysis of these labour market statistics, logical considerations also lead to the conclusion that the inhibitory effects of the existence of zombie companies on overall economic performance are likely to be very limited: Spain, which Borio et al. cite as an important example of labour reallocation, has indeed experienced a construction boom since the introduction of the euro. Shortly before the crisis, the construction sector had reached the highest share of GDP in Europe at around 12 %. However, the increase in employment was mainly due to low-skilled workers and immigrants, many of whom had previ-

[52] Own calcluations based on data from www.stats.oecd.org.

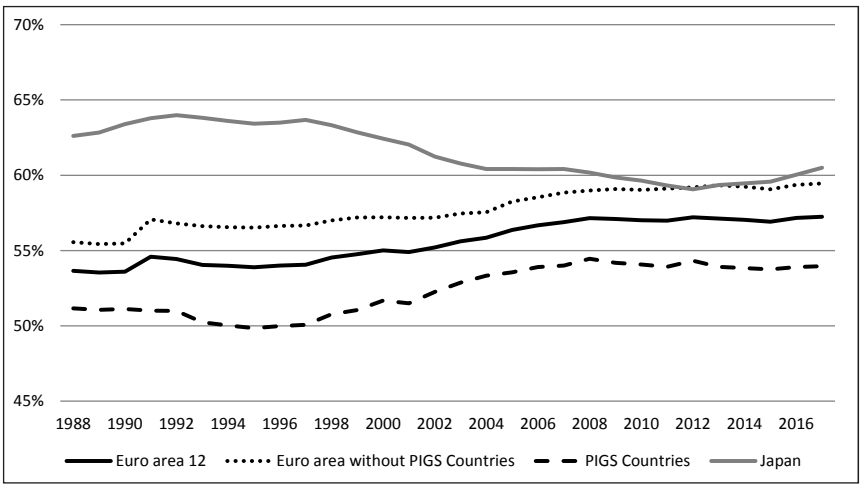

Figure 4: Labour Force Participation Rate in Japan and the Euro Zone[53]

ously been unemployed and had not switched from the "productive sectors". After the crisis, a large number of employment contracts in the construction sector were dissolved – 920,000 of the 1.64 million dismissed workers in Spain's economy had been in the construction sector. This led to the paradoxical situation that productivity initially rose after the crisis because more people and particularly the low-skilled were made redundant than the decline in production would have required.[55]

The assertion that productive companies, for example in Spain, would not have been able to exploit their growth potential in an economic crisis with a sharp rise in unemployment simply because they could not find suitable employees who were instead tied up in zombie companies contradicts the facts. On the contrary, it is likely that the structural weaknesses in Southern European countries were too strong and the profit expectations too low to encourage solvent firms to employ more people.

The inconsistent regression results should therefore come as no surprise: In Japan, labour was still relatively well utilized during the crisis. In Europe, on the other hand, the unemployment rate in many countries skyrocketed and has, in large part, not yet returned to original levels. In this respect, the assumption of considerable crowding-out by zombie companies for Japan was understandable,

[53] Own calcluations based on data from www.stats.oecd.org.

[54] Own calcluations based on data from www.stats.oecd.org.

[55] See *Köhler* (2010).

not only in terms of capital, but also in terms of employment. But to apply this insight to the European economy, with massive underutilization of labour and on average significantly lower zombie shares, is more than questionable, both logically and empirically. For us, the question arises whether Borio et al. deliberately exaggerate the magnitude of the problems that zombie companies create for achieving growth in Europe[56] in order to find excuses to demand an end to the ECB's low-interest policy and to divert attention from the more obvious diagnosis of balance sheet recession and secular stagnation.

VI. The Cost of Zombification Versus the Risk of Secular Stagnation and Balance Sheet Recession in the Euro Area

In the autumn of 2013, former US treasury secretary and Harvard economist Larry Summers invoked a previously discredited 1930s theory known as secular stagnation in his seminal speech at the International Monetary Fund to explain current low growth rates. The following points played a role in his thinking:

- With demographic change in industrialised countries, ageing societies save more. Anticipated declines in the population are already reducing necessary investments for the future.
- An increasing share of the service sector and the expansion of the shared economy leads to less investment in property, plants, and equipment.
- In the past, great technical innovations helped to moved society beyond agricultural production. From today's point of view, these "low-hanging fruits" have now been harvested, and the time of revolutionary inventions and discoveries appears to be over. It is currently unlikely that innovations will be made in the coming years that will generate the same gains in prosperity as, for example, the steam engine or the railway did in the past. Instead, we have currently reached an industrial technological plateau, and the positive growth effects that may be provided by artificial intelligence, machine learning, or robotics are still unclear.[57]
- Increased inequality in industrialised countries is accompanied by a redistribution of income and wealth in favour of the richer, resulting in a lower consumption rate.

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[56] Recall the aforementioned study by *Goto* and *Wilbur* (2019), who concluded in the Japanese context that zombie SMEs may often escape their zombie status by recovering or escaping rather than by remaining zombies. Precisely this type of company dominates European economies due to their large number. SME companies provide a high level of employment (employing two thirds of the overall workforce) in euroland and contribute 60 % of overall gross value added to GDP.

[57] See *Gordon* (2010) and *Cowen* (2011).

Summers argued in 2019 that it may have become all but impossible to boost growth by using lowering interest rates to increase investment and consumer spending. The answer, he argued, was for governments to spend more instead. In his view, there is something unhealthy about an economy in which companies can borrow for nothing. However, this development is the very counterproductive side effect of the policy mistake to fight existing secular stagnation with a repeatedly loosened monetary policy alone.[58]

On the other hand, according to Feldstein it is obvious that econometrically inherited historical "average real interest rates" of approximately two percent are too high a hurdle for companies in the current post-crisis period.[59] This fits with Wicksell's warning that it makes no sense to stare at absolute interest rates. Wicksell writes in *Interest and Prices*:

> "The natural of interest on capital is not fixed or unalterable. […] In general we may say, it depends on the efficiency of production, on the available amount of fixed and liquid capital, on the supply of labour and land, in short on all the thousand and one things which determine the current economic position of a community, and with them it constantly fluctuates."[60]

In line with Wicksell's observation, financial markets have significantly revised their growth expectations downwards for the coming years. In an ever-changing world, at least market participants have understood that the natural interest rate (real rate) is neither a natural constant that can be derived as an average of past real interest rates of, e. g., 2 %, nor is the marginal efficiency of capital stable, but rather fickle and highly unstable according to *Keynes* (1936). In this context, a recent working paper by Schmelzing used real interest rates samples starting in the early 14th century when financial markets began to emerge. He found "global real rates have shown a persistent downward trend over the past five centuries"[61] Wicksell for example describes the behaviour of the French central bank in his time:

> "The Bank of France has at last given up the principle (it should rather be called the routine) of not lowering its official rate below 2½ per cent, and has accommodated itself to a rate of 2 per cent. But a rate of 2 per cent does not imply 'the most favourable conditions available'. It is favourable only if the borrower can earn more than 2 per cent per annum on the capital that he borrows, it is very unfavourable, indeed ruinous, if after deductions for costs and risk there remains a profit of less than 2 per cent on the capital. The objection that a further reduction in rates of interest cannot be to the advantage of the banks may possibly in itself be perfectly correct. A fall in rates of interest may diminish the bank's margin of profit more than it is likely to increase the extent of their business. I should like then in a humility to call attention to the fact that

[58] *Summers* and *Stansbury* (2019).

[59] *Feldstein* (2018).

[60] *Wicksell* (1936), p. 106.

[61] *Schmelzing* (2020).

> the bank's prime duty is not to earn a great deal of money but to provide the public with a medium of exchange – and to provide this medium in adequate measure, to aim at stability of prices."[62]

Nevertheless, the thesis that it is alone or above all the Hayekian addictive drug of cheap (central) bank money that leads to subdued growth by promoting zombie companies continues to find its supporters. Indeed, discussion of this idea after the last ECB rate cut in September 2019 has intensified. Participants in this discussion rightly argue that at some point, interest rates can become so low that the detrimental effects on the banking sector outweigh the benefits of lower rates. Brunnermeier and Koby refer to this rate as the "reversal rate."[63] However, as far as we understand, this debate is far from using hypothetical calculated costs of zombification as a lever to demand a completely different monetary policy for the ECB, as Borio and supporters of Austrian economics do in demanding an inmediate drastic change in monetary policy towards past long-run average short-term rates.

Schnabl and Schnabl and Sinn, for example, even suggest reducing corporate investments by (Darwinian) raising of interest rates.[64] Schnabl explained in an interview without any reference to the degree of utilization of an economy:

> "The financing costs are the yardstick for the performance of investments. If the interest rate were 5 %, for example, only investment projects that promise a return of over 5 % would be financed. Companies would have to work very hard to achieve this. If the interest rate is close to zero, projects with low expected returns will also be financed […].
>
> The exit from ultra-loose monetary policy must take place very slowly. Otherwise, many companies, banks, and governments would collapse. For example, interest rates could rise by 0.5 percentage points per year, but this path should not be abandoned. Then governments would have to reform, banks would have to put in place non-performing loan reduction strategies, and firms would have to increase their efficiency. After ten years, the key interest rate would return to 5 %, which I roughly consider to be a long-term equilibrium."[65]

However, in stark contrast to Schnabl, most research shows that investment decisions are driven by multiple factors. While the financing costs are important, other factors such as the rate of capacity utilisation, expected future demand and the level of uncertainty are more decisive parameters. Business investment often increases in response to a change of economic activity. In the aftermath of the crisis, European firms tended to cancel or postpone investment decisions and retain their earnings (i. e., increase their savings). As a conse-

[62] *Wicksell* (1936), p. 190.

[63] *Brunnermeier* and *Koby* (2016).

[64] See *Borio* (2018); *Schnabl* (2018); and *Sinn* and *Schnabl* (2016).

[65] *Schnabl* (2018). The authors are not aware of any regression analysis leading to average interest rate of 5 %.

quence, investment gaps built up in many countries, compared to past averages and to projected future steady-state levels. Business investment in the euro area has still not reached the level of the year 2008 and is far below its pre-crisis trend. The weakness of investment is largely a result of the still-ongoing efforts by the private sector in a balance sheet recession to strengthen balance sheets by paying down debt.[66] Contrary to Schnabl, in this environment, even the "Hayekian addictive drug of cheap money" is no game changer. Profit expectations for European corporations are too low due to the current weak overall demand to invest (in excess) in new capacities.

A part of the observed secular stagnation in the euro area may be due to a balance sheet recession.[67] In such an environment, the cost of a radical exit from the ECB's currently expansive monetary policy, as Borio, Sinn, and Schnabl demand, can be estimated by simulations with an appropriate macroeconomic model. DSGE models, for example, are often used by central banks and economic research institutes. They combine long-term neoclassical modelling with short-term nominal rigidities. Simulated macroeconomic shocks, such as unexpected interest rate hikes, have effects over several periods in these models. Wieland et al. have compared the dynamics of different DSGE models with respect to unexpected macroeconomic shocks. For the euro zone, eight different models deliver for an unexpected interest rate hike of 1 % on average a cumulative GDP contraction of about 0.46 % within three quarters. Thereafter the economy grows again at equilibrium, but this also means that the GDP loss is permanent.[68]

We will not attempt here to estimate the effects of an interest rate hike of 5 %, as requested by Schnabl, for example, by simply upscaling the estimated effects of a much weaker interest rate hike of 1 %. However, the long-term growth loss of GDP for an interest rate hike of 1 % of 0.46 % as estimated by Wieland et al. has to be considered in relation to the hypothetical best-case growth gains in GDP in Borio's model world without zombie companies of about 3.6 % over 10 years or 100 euros per capita and year. There are very good reasons to question even this small burden and to consider the cost of zombifiaction calculated by Borio et al. simply as a mirage. Recent research on Japan has shown that small and medium-sized entreprises may often escape zombie status through recovery or exit rather than perpetually remaining zombies.[69] Precisely these companies are the backbone of the European economy. Furthermore, Borio et al. got the European labour market wrong. In constrast to the situation in Japan, there was and is no need for "creative destruction" of, for example, the

[66] See for an overview, see *Ademmer* and *Jannsen* (2018), *Koo* (2009).

[67] *Koo* (2014).

[68] *Wieland* et al. (2016), pp. 41f.

[69] See *Goto* and *Wilbur* (2019).

Spanish construction sector in order to use realeased labour as a "raw material" for more productive sectors. Fighting such fata morgana with a drastic increase in ECB interest rates towards the long-term average of past short-term rates would bring only additional growth losses in a period of secular stagnation.[70]

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[70] See also Obstfeld and Duval (2018).

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