



A brief survey of the debate on real interest rates and their long-term equilibrium

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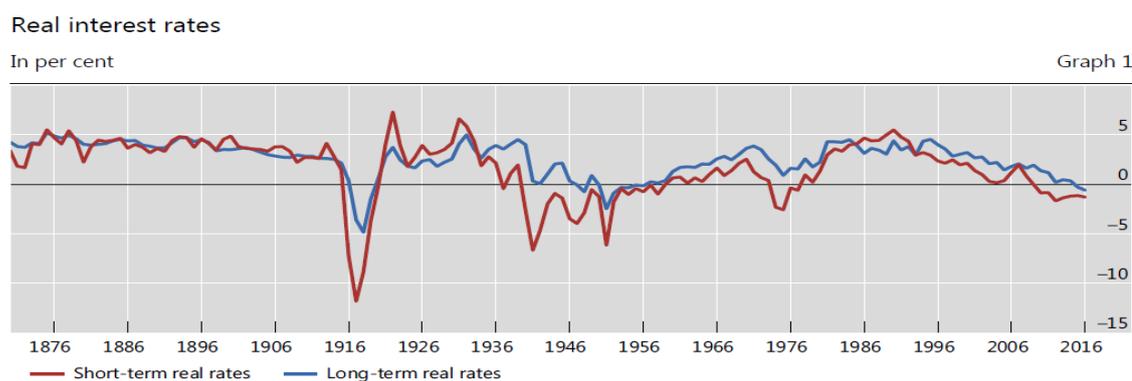
In this paper we discuss real interest rate determination from a theoretical point of view and look at various empirical estimates of their long-term equilibrium and forecasts.

1. Introduction

Both nominal and real interest rates have fallen since the end of the 1980s in the main advanced economies (see Figure 1). Due to the liberalization of capital markets and global trends in advanced countries, this is a global phenomenon. Widespread inflation-targeting has tended to moderate inflation and inflation expectations, and the drop in real interest rates has been attributed to structural factors associated with a decline in the natural rate of interest (defined as the level of interest rate consistent with non-inflationary growth when output is close to potential). The natural rate of interest is unobservable, and estimates vary widely. However, the fact that the fall in interest rates has not given rise to inflation implies that the natural rate of interest has also fallen substantially.

According to Obstfeld et al. (2015), who researched this subject for the U.S. Treasury, an explanation for why interest rates are so low, and whether those low levels will persist, is currently one of the most difficult questions facing macroeconomists.

Figure 1: Global short and long-term real rates (19 currently “advanced” countries)



Sources: Authors' calculations.

Source: Borio et al. (2017)

2. Real Interest Rate Determination: A Saving and Investment Framework

As the interest rate is the price that equilibrates the economy's supply of saving with the demand for investment, factors influencing investment and savings are often considered to

have led to a fall in real interest rates:

- Factors increasing savings or demand for safe assets
 - Demographics (lower fertility rates, rising dependency ratios, rise in longevity)
 - Higher demand for safe assets/portfolio shifts from equities to bonds (savers in emerging markets seeking safe assets in advanced countries, regulatory requirements introduced during the financial crisis, risk aversion), while supply of safe assets has shrunk (toxic assets, bonds of some EU countries)
 - Rising income inequality within countries (higher propensity to save of the wealthy)
- Factors depressing investment
 - Declining total factor productivity growth and slowing labor force growth (due to demographic forces) leading to slower potential/trend economic growth and a fall in the marginal return on capital are considered to be the most important factor
 - Increase in the spread between risk-free and broad rate of return on capital
 - Deleveraging and risk aversion also important after the global financial crisis
 - Lower capital-intensity of production and lower price of investment goods, reducing the amount necessary for investment spending
 - Increasing mark-ups (after a period of intensifying economic integration in Europe, East Asia and North America came to a close, gains in competition have slowed)
 - Less public investment in some advanced countries
 - Uncertainty (e.g. as to taxes, structural reforms and technological change)

3. Real Interest rate Determination: Financial Cycles and Monetary and Structural Policies

The foregoing explanations of the decline in real interest rates since the early 1980s are based on the assumption that real interest rates are driven by variations in desired saving and investment. A different kind of explanation can be heard from the BIS.

Borio et al. (2019) suggest that low real interest rates are due to an asymmetric response of monetary policy to financial boom-bust cycles over the past decades, not leaning against the boom but easing after the bust. Persistent resource misallocations and debt overhangs after balance sheet recessions constitute a further drag on growth and make it more risky to raise rates. Banerjee et al. (2018) find that this ratcheting-down in the level of interest rates after each cycle has reduced the financial pressure on zombie firms to restructure or exit, thereby contributing to the prevalence of zombie firms weighing on aggregate productivity.

The results of Gourinchas and Rey (2017) suggest that the slowdown in productivity growth or demographic forces are unlikely to be the main drivers of the decline in the natural rate of interest. They find that it is rather the bust of financial boom-bust cycles which has led to a collapse in interest rates on safe assets, by triggering increased demand for safe assets and economy-wide deleveraging dynamics.

Hamilton et al. (2015) find that the relationship between GDP growth and real interest rates tends to be weak. According to Taylor (2016), there has been no significant decline in the natural real interest rate; and the current low level of the real interest rate could well be caused by shifts in structural and monetary policies that have been omitted from the research.

Based on data stretching back to 1870 for 19 countries, Borio et al. (2017) argue that the link between real interest rates and saving-investment determinants does not survive over the extended sample. Instead, they find evidence that persistent shifts in real interest rates coincide with changes in monetary regimes. This could work through various channels: inflation expectations can be better anchored in some monetary policy systems than others, e.g. in the last 30 years with inflation-targeting and before that under the gold standard, so that changes in nominal rates are transmitted to real interest rates. Furthermore, they find that variations in interest rates of countries that dominate global monetary and financial conditions have a greater influence on real interest rates than common movements in global saving and investment. This leads them to suggest that the role of monetary policy in determining real interest rates over long horizons has been underrated.

4. Empirical estimates

OECD economists (Rawdanowicz et al., 2017) apply econometric time-series analysis to test jointly several determinants of long-term real government bond yields in G7 countries since the early 1970s that have been suggested in support of three different hypotheses: saving-investment imbalances (demographics), supply and demand for safe assets and monetary policy at home and abroad. They found that real long-term government bond yields are closely linked with real policy interest rates both in the short and long term, while there is little evidence that real policy interest rates followed secular declines in real potential GDP growth (a proxy of natural interest rates).

Furthermore, according to Rawdanowicz et al., domestic real long-term interest rates are closely associated with foreign rates, likely indicating the importance of spillovers and common global trends. However, they found that although falling dependency ratios and a rising share of the high-saving population since the early 1970s tend to lower real yields, the decline in bond yields was rarely consistent with the evolution of household savings, which raises questions about the transmission mechanisms of demography. Data was not available on private safe assets.

Researchers at the Bank of England (Rachel et al., 2017) develop a simple global growth-accounting framework and saving-investment framework to quantify the relative importance of the main secular trends in expectations for growth and changes in preferences that could be driving the global natural real interest rate, using data from 1980 to 2015. They found that of the 450 bps drop in risk-free real long-term interest rates across the world (in both emerging and developed economies) over the last 30 years, 100 bps were due to expectations of a decline in future trend growth, 160 bps due to increased desired savings, and 140 bps from decreased desired investment. Two determinants appear particularly relevant: the impact of demographic forces on desired savings (90 bps) and that of a rising spread between risk-free rates and the broad rate of return to capital (i.e. higher credit spreads, raising financing costs for firms), dampening desired investment (70 bps). Caballero et al. (2017) find that a substantial part of the increase in that spread reflects increased compensation for risk, indicating a substantial increase in the demand for or a significant decline in the supply of safe assets relative to risky assets. More recently, Rachel and Summers (2019) estimated that the natural rate of interest in a block of all industrial economies has declined by at least 300 bps over the last generation, due for the most part to changes in saving and investment propensities. Researchers at the ECB (ECB 2018) attributed 100 bps to the impact of the demographic transition¹ and expect this to depress rates further by 25 – 50 bps by 2030. LSE professor Bean (2015) believes that aggregate savings propensities should fall back as the bulge of high-saving middle-aged households moves through into retirement and starts to dissave; he

¹ Other drivers being waning productivity growth, a rise in mark-ups and a surge in risk aversion in the wake of the global financial crisis.

concedes, however, that it is possible that the present environment will persist “for some considerable time” yet. In the view of Rachel et al. (2017), in the absence of sustained changes in policy, most of these forces look set to persist, and some may even build further. They suggest that the global neutral rate may therefore remain low and perhaps settle at around 1 percent in the medium to long run.

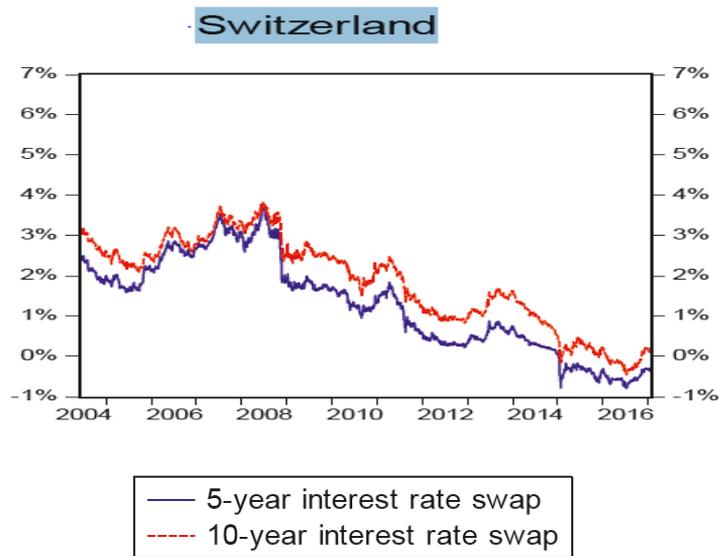
Generally speaking, estimates concern the past or the present, there is little in the way of forecasts and these are extremely uncertain. On the basis of their simulations, Gourinchas and Rey (2017) predict that the average short-term real risk-free rate is expected to remain in negative territory to 2021. Most estimates of the current natural rate of interest of researchers at the ECB are in negative territory regardless of the type of model used (ECB 2018). While they consider that demographic factors (continued rise in longevity and old-age dependency ratios) would suggest that the natural rate of interest is more likely to fall than to rise in the medium term, they stress doubts about the ability to forecast the natural rate of interest other than with models that consider the demographic transition. Econometric approaches are backward-looking. As to semi-structural models, the two core components of the natural rate of interest (growth and a catch-all, non-growth factor) are assumed to be random walks. Forecasts of structural models display the adjustment of the natural rate of interest towards the model’s steady state, which in turn merely reflects historical patterns. This said, ECB researchers believe most of the trends captured by their models will remain intact for years to come (the current demographic inflection point and the productivity and growth trends emerging from it). They only see the natural rate of interest rising in the short run if there is a lower degree of risk aversion or a technology-driven boost to productivity.

Hamilton et al.’s (2016) findings, based on narrative and econometric analysis using cross-country data and going back to the 19th century, support a wide range of plausible estimates for the current level of the natural rate, from a little over 0% to the pre-crisis consensus of 2%.

The decline in the estimated natural rate in Switzerland appears to have been similar to the decrease in other economies. One approach to examining this question is based on information from the financial markets. Gerlach et al (2017) compute natural interest rates as the difference between the 5y/5y forward interest rate swap² and a measure for expected inflation. According to this measure, a downward trend since 2008 can be observed in Switzerland (see Figure 2).

² Interest rate swap in 5 years for 2024-29.

Figure 2



Source: Bloomberg

Source: Gerlach et al. (2017)

5. Future Path of Interest Rates

Some factors depressing interest rates are likely or sure to fade or their effects to reverse over time, such as post-crisis private-sector deleveraging and risk aversion, current political and economic uncertainties and demographic dependency ratios.

Other factors are likely to be longer-lived, such as the growing market power of industry, and new financial boom-bust cycles. A globalized world fraught with higher uncertainties and tail risks such as environmental risks, cyber threats, virulent infectious disease outbreaks, and intensified geopolitical instability could discourage investment and thereby keep interest rates low.

As to the future effect of some of the other factors, opinions vary widely: in particular, future developments in productivity. Joel Mokyr et al. (2015), for example, stress that there are still many technological challenges to be solved, that competition between firms, nations, and major trading blocs will stimulate continued efforts at technological gains, and he argues that there is an underappreciated growth potential in the tools available for science and technology researchers. Robert Gordon (2016), on the other hand, argues that the scale of innovations between 1870 and 1970 can't be repeated, and that productivity growth will be held back by rising inequality, stagnating education, an ageing population, and the rising debt of college students and the federal government. Thus, while some believe that lower capital-intensity of production, sluggish productivity and potential growth could pick up due to future technological progress, others believe that weakness in the economy will last unless radical policy changes are undertaken. Rachel et al. (2019) suggest that absent offsetting policies, mature industrial economies are prone to secular stagnation. As to market power, there is also disagreement about whether or not the globalization process is terminated. Netherlands' Bureau for Economic Policy Analysis (CPB) researchers (Veenendaal et al., in Hoekman, 2015) find that there is no evidence for a structural trade slowdown: while in China there was a fall in foreign value-added shares in exports, in Europe and East Asia value-added shares in exports are trending towards new peaks. As to the role the emerging markets will play in the future, there could be growing demand for safe assets in emerging market countries with

underdeveloped financial markets; on the other hand, the rebalancing of growth in China toward higher private consumption could reduce global savings.

There are also uncertainties around future monetary regimes. How much longer will central banks use an inflation-targeting framework? Will a future regime target both price and financial stability and thereby moderate the boom-and-bust financial cycles, as Borio recommends? Other unforeseeable events could also lead to a rise in real long-term interest rates in the coming years such as a sudden stop in flow of funds from Asia and other BRICs to the developed world. International political developments, debt levels, supply side shocks and inflation expectations constitute other factors that are hard or impossible to predict.

6. Conclusion

Whether or not the factors that have led to low long-term interest rates will keep them lower in the longer term than they were in the 1980s is unclear. The natural rate of interest is unobservable, and estimates vary widely. However, the fact that the fall in interest rates has not given rise to inflation implies that the natural rate of interest has also fallen substantially. Most estimates for the current long-term natural rate of interest are not higher than 0.5%. The decline in the estimated natural rate in Switzerland appears to be similar to the decrease in other economies. Researchers at the Bank of England Rachel and Smith conclude that in the absence of sustained changes in policy, most of the forces keeping the global real natural interest rates low look set to persist, and some may even build further. They suggest that the global natural rate of interest may therefore remain low and settle at around 1% in the medium to long run.³ Researchers at the ECB, whose current estimates are mostly in negative territory, consider that demographic factors (past slump in fertility rates, continued rise in longevity and old-age dependency ratios) would suggest that the natural rate of interest is more likely to fall than to rise in the medium term. Bearing in mind all the uncertainty, they find that mechanical projections attach a higher probability to natural interest rates staying at levels around zero, or slightly below, in the coming years, rather than to a rebound. Over the short-term a rise in the natural interest rate would have to come from “a lower degree of risk aversion or a technology-driven boost to productivity”. LSE professor Charles Bean believes that demographic factors and rebalancing in China will eventually cause the natural rate of interest to rise again; however, he concedes that it is possible that the present environment will persist “for some considerable time” yet.

³ Rachel and Smith define the global neutral rate as the rate to which country-specific equilibrium rates will converge in the long term, absent distortions and shocks. They see this rate as an anchor for equilibrium real rates in open economies. They stress that in reality, plenty of distortions and shocks as well as structural characteristics will drive a wedge between country-specific real rates and this long-term anchor. They add that an individual country’s monetary policy stance can also temporarily drive a wedge between a country’s equilibrium real rate and the actual real policy rate.

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