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Low real rates as driver of secular stagnation: Empirical assessment

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ABSTRACT

We empirically test whether there is a causal link between the real interest rate and the natural rate of interest, which could be a harbinger of secular stagnation if the real rate declines. Outcomes of VAR models for seven OECD countries show that a fall in the real rate indeed affects the natural rate. This causality is significant for Japan in all model specifications, for Canada, France, UK and Germany in some specifications and it is not significant for the US and Italy. The policy implication is that to avoid secular stagnation, expansionary monetary policy to reduce the real rate is less effective than policies aimed at raising the natural rate.

1. Introduction

The debate on secular stagnation centres on the natural rate – the short-term real interest rate consistent with full employment – and on the real interest rate.[1] While both rates are related, they have different dimensions and different drivers. The natural rate is a structural variable, driven by real economic factors. While it is unobservable, the natural rate can be approximated by long-term potential economic growth or by the marginal product of capital. The ex-ante real interest rate – measured by the nominal rate deflated by expected inflation – is a cyclical variable, which reflects financial market conditions, inflation dynamics and monetary policy reactions.

The steady downward trend of real interest rates worldwide over the last 30 years has raised the issue of whether the natural rate has fallen in tandem. Blanchard et al. (2014) conclude that the factors that led to low real interest rates are unlikely to be reversed and that the natural rate may remain low as well. This view assumes that the fall in the real rate is a reflection of changing saving and investment patterns which also drive the natural rate. The real rate is then an indicator for the natural rate. Borio and Disyatat (2014) go even further and argue that low interest rates validate themselves, suggesting that the natural rate would fall as a result.

There are several channels through which this causality can run. According to Borio and Disyatat (2014), low real rates stimulate an increase of debts. As a consequence, countries may end-up in a debt trap. In that situation it is difficult to raise rates without damaging the economy and so the interest rate becomes structurally lower. A debt overhang can be mirrored in a suboptimal excess of the capital stock, as a low interest rate reduces the incentive to write-offs the existing capacity (Forbes, 2015). A related channel is that low real rates and high debts create resource misallocations. Choi et al. (2014) formalise this in a general equilibrium model with heterogeneous productivity of agents. If the interest rate falls, the less productive agents start to invest and this diminishes the average quality of investments and thereby potential growth (a proxy of the natural rate). White (2012) extends the misallocation channel in various dimensions, distinguishing between vertical (across time) and horizontal (across sectors) misallocation. Empirical evidence for inefficient resource allocation in the current low interest rate environment across sectors is reported for the UK, where less efficient firms continued operating, causing a substantial increase in the dispersion of firm productivity across sectors (Barnett et al., 2014). Caballero et al. (2008) describe a related channel based on the misallocation of bank credit. They find evidence that after the asset-price collapse in the early 1990s undercapitalized Japanese banks kept on lending to insolvent borrowers (zombies). This kept

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[1] See Pagano and Sbracia (2014) for a critical discussion of the secular stagnation hypothesis.

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less productive firms alive and reduced total factor productivity (TFP) growth, which is closely related to our measure of the natural rate.[2] Forbearance in bank lending also had some contribution to lower productivity growth in the UK during the recent crisis (Arrowsmith et al., 2013). Cette et al. (2016) come to similar conclusions for countries in Southern Europe. In an empirical study they show that TFP growth, in particular in the manufacturing sectors, is affected by a decline in the interest rate. Another channel through which the financial sphere affects the natural rate is modelled by De Fiore and Tristani (2011), who show that the natural rate falls after a financial shock, represented by rising credit spreads (risk channel). This causality is explained by the protracted decline of consumption as key determinant of the natural rate. In their model the natural rate is independent of monetary policy.

Bernanke (2015a) argues that low real interest rates do not necessarily imply low economic growth (as proxied by low natural rate), because this hypothesis ignores the international dimension. Unless real returns are low everywhere, capital will flow out from countries with lower returns to countries with better opportunities. The resulting capital outflow will weaken the exchange rate, which supports export and boosts growth, thus invalidating the low growth predication by secular stagnation. In our model, we take into account this (potential) international channel.

The research question of this article is whether there is a causal effect that runs from the real rate to the natural rate. This effect has not been investigated empirically in the literature yet, which might be related to the fact that both rates have a different (time) dimension and can only be measured by approximation. The ex-ante real interest rate can be inferred from actual bond yields and market expectations on inflation. Hence, it tends to move with the financial cycle. The natural rate is the equilibrium value to which the real rate converges in the long run. In that sense there is also a link running from the natural rate to the actual real rate, with the former being an attractor for the latter. The channel for this causality is that expected returns (i.e. the ex-ante real rate) on investments will be lowered if potential output growth (i.e. the natural rate) declines. This refers to the indicator function of the real rate, which can be influenced by expectations of potential output growth through an information channel.[3] Expected potential output growth can also influence the real interest rate through the credit demand channel. If improving output expectations stimulate investments and credit demand, market interest rate will rise as a result (and vice versa).

We first extend the benchmark model of the natural rate by including the effect of the real interest rate on potential output. Then we investigate the link between the natural rate and the real rate empirically. To account for the likelihood that both variables may influence each other, we estimate Vector Autoregression models (VAR) for Canada, France, Germany, Italy, Japan, UK and the US. To identify the interaction effect of both variables, we control for technology shocks, terms of trade shocks and demand shocks in the VARs. The simulation outcomes provide evidence for a significant effect running from the real rate to the natural rate, which is statistically significant for Japan in all model specification, for Canada and France, UK and Germany in some specifications and is not significant for the US and Italy. This result confirms that low real rates can lead to a decline of potential output growth. For Japan, France (and to a lesser extent also for Canada and the UK) we find a significant effect running from the natural rate to the real rate, which reflects that market prices catch up with changing long-term growth prospects.

Our results suggest that monetary policy actions may affect the natural rate of interest by influencing the real interest rate. The causality between the real rate and the natural rate implies that an expansionary monetary policy which successfully reduces real rates can become less effective for two reasons. First, the desired stimulus on demand, which depends on the difference between natural and real rate, will be smaller (monetary policy is expansionary if the short-term real interest rate lies below the natural rate and a decline of the natural rate thus reduces the monetary stimulus effect). Second, a decline of the natural rate, i.c. potential output growth, will affect inflation, lift the real rate and so counteracts the monetary policy stance.

The rest of the article is structured as follows. In Section 2 we motivate how the benchmark model of the natural rate can be extended by including the relationship with the real rate. Section 3 explains how we determine the real rate and the natural rates empirically and in Section 4 we specify the VAR model. The simulation outcomes are presented in Section 5, after which several robustness tests are conducted in Section 6. In Section 7 we discuss the outcomes and put them in a broader context. The last Section draws some policy conclusions.

2. Benchmark model

In the literature, models used to estimate the natural rate assume that potential economic growth is independent of the real interest rate. In the benchmark model of Laubach and Williams (2003) the level of potential output (y^*) is determined by,

$$y_t^* = y_{t-1}^* + g_{t-1} + \varepsilon_{1,t} \tag{1}$$

$$g_t = g_{t-1} + \varepsilon_{2,t} \tag{2}$$

which specifies the level of potential output (y^*) as a function of its growth rate g. The growth of output also determines the natural rate of interest (r^*),

$$r_t^* = cg_t + z_t \tag{3}$$

where z_t captures other determinants of r_t^*, such as households' rate of time preference. Laubach and Williams assume that z_t either is a stationary autoregressive process, a random walk or that it is a constant term. In their model estimations, the coefficient c (which relates the natural rate to the trend growth rate) is near unity, which implies that the natural rate by and large equals the trend growth rate (assuming that z_t is a residual term with an expected value of zero). Both the natural rate of interest and potential output enter the demand curve (IS curve),

$$\tilde{y}_t^* = A_y(L)\tilde{y}_{t-1}^* + A_r(L)\left(r_{t-1} - r_{t-1}^*\right) + \varepsilon_{3,t} \tag{4}$$

where $\tilde{y}_t^* = \left(y_t - y_t^*\right)$ is the output gap, y_t is real GDP and r is the real interest rate. Fig. 1 shows the IS curve (Eq. (4)) and potential output (Eq. (1)) in a stylized form, as in Williams (2003). The downward-sloping curve indicates a negative relationship between spending and the real interest rate. The vertical line presents the level of potential GDP, which is assumed to be unrelated to the real interest rate, as in Eqs. (1) and (2). At the intersection of the IS curve and the potential GDP line, the real interest rate equals the natural rate of interest.

In Laubach and Williams (2003) Eqs. (1)–(4) are part of a state space model. This is the theoretical framework for our modelling

[2] See Cizkowicz and Rzonca (2011) for a further discussion of channels that distort credit flows leading to lower TFP-growth.

[3] There are other factors that can influence the natural rate that are beyond the scope of this paper, but relevant in practise and important in the debate on secular stagnation. Here we would like to mention the hysteresis hypothesis for capital and labour. This hypothesis implies that potential output, and hence the natural rate, can be raised by stimulating demand for capital and labour during a recession. Jimeno et al. (2014) argue that supply-side policies will help boost demand in the current weak economic environment in the Eurozone by creating a more dynamic business environment.

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