

Is the natural rate of growth exogenous? A reply

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Boggio and Seravalli (BS) are wrong when they argue that the logic of our model implies that there can be only one unique natural rate of growth.

The error comes from a misunderstanding, and their mis-specification of our model. They represent the model by saying that the natural rate of growth (g_n) is a *continuous* function of the actual rate of growth (g). Given this specification, $g_n = f(g)$, and the definition of g_n as that rate of growth that keeps the percentage level of unemployment constant, BS would be correct, as they show in their Figure 1.

However, from the arguments and empirical tests we carry out, it should be clear that we do not argue that g_n is a continuous function of g ; but rather that there are high and low *growth regimes* in which the natural rate of growth differs due to increased labour force growth and productivity growth. Without this distinction, it would be impossible to test empirically BS's function. Specifically, if g is above g_n and the percentage level of unemployment is falling, it is in these conditions that underemployed labour is encouraged to seek work; immigration takes place; employers seek ways to economise on labour, and the rate of capital accumulation (embodying technical progress) is augmented. Contrawise, if g is below g_n the opposite occurs. BS recognise that this is a possibility, had they hypothesised a non-continuous function with more than one intersection with the 45°

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line.¹ *This is precisely what our specification does.* And we use this specification because most of the mechanisms that come into play to affect the natural growth rate only do so when actual growth is above or below the natural rate. Hence, we argue that there are different growth regimes we can test for. A high growth regime where:

$$g = a_1 - b(\Delta\%u), \quad (1)$$

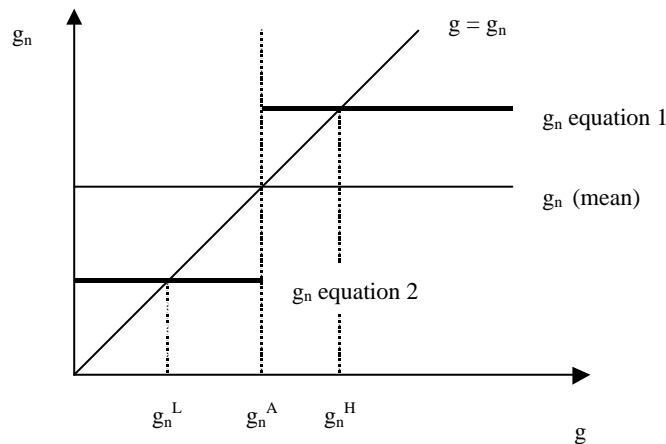
and a low growth regime where:

$$g = a_2 - b(\Delta\%u), \quad (2)$$

with $a_1 > a_2$.

We find this supported empirically for all our fifteen countries. What we are doing can be shown in Figure 1 below (compared with BS's Figure 1).

FIGURE 1



The problem with BS's comment is that they confuse a statistical mean from which we obtain measures of g_n with the analytical logic of the model. The equation $g_n = A + B(g)$, which is how they derive their result, is simply a misrepresentation of the model. But most importantly, our equations are merely a statistical tool to obtain average estimates of the natural rate of growth in both regimes and not a *theory of the natural rate*. Theoretical models of the endogeneity of the

¹ This spline function is further explained in León-Ledesma and Thirlwall (2002).

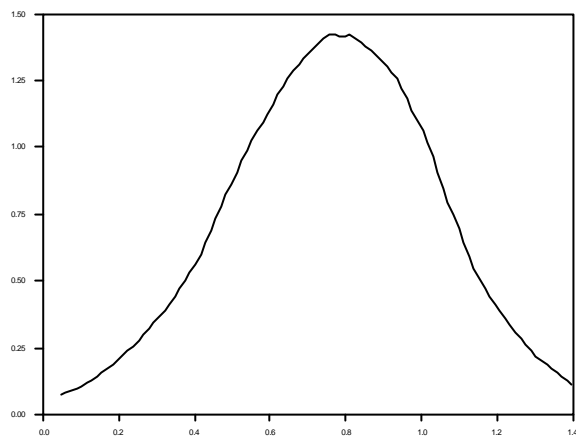
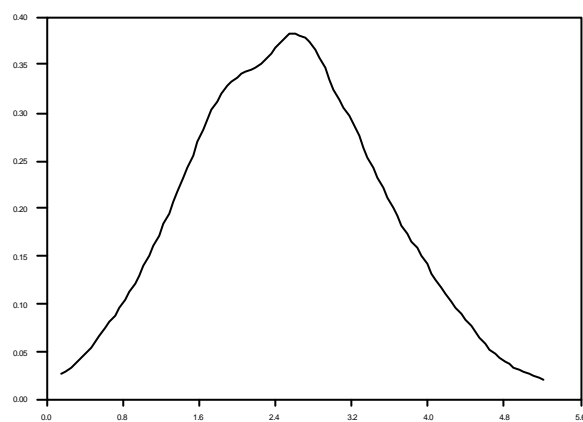
natural rate should not be based on our statistical specifications but on well-known demand-led growth models that encompass our 'empirical' findings (e.g. export-led growth models incorporating Verdoorn effects such as in León-Ledesma 2002).

Finally, as regards the simulation experiment presented in their Appendix on the possible bias of our results, two comments are in order. First, given that they draw their random experiments using the residual variance for the case of Italy, it is not surprising that their results partially support their statement. Italy is the country with the second highest residual variance in the sample, which increases the likelihood of their simulation results being favourable to the criticisms raised. The reader is referred to León-Ledesma and Thirlwall (2002) to see that Italy is the only case in which 'theoretically abnormal' observations could be biasing our results towards favouring the changing natural rate of growth hypothesis. Secondly, by the simulations carried out by BS it is clear that the highest frequency occurs at values of the dummy parameter between 1.3 and 1.5. The frequency becomes zero for values above 2.5. Hence, their results are not able to explain why the point estimate of this dummy coefficient is 4.215, with a t -ratio of 7.937, which is significantly different from 1.4 at the 99% level and different from 2.5 at the 95% level.

We replicated BS's exercise drawing the simulations with the UK data. The UK is by no means the country showing the smallest residual variance. The average rate of growth of output is 2.313 with a standard deviation of 2.022. The residual variance for the estimated natural rate of growth equation is 1.598, which is above the residual variance of six other countries in our sample. The frequency distribution of 10,000 draws of BS's simulation for the dummy coefficient, and its associated Student's t statistic, are presented in Figure 2. As can be easily seen, the highest frequency occurs at values of the coefficient of around 0.8, much lower than those presented by BS. If the same exercise is carried out based on US data, the coefficient of the dummy is even lower and its t -ratio is below 1.7.

We conclude that BS's nihilism is misplaced. They argue at the very beginning of their comment that it is a mistake to think of the growth of the labour force and labour productivity as constant or exogenous, and yet they seem to want to deny that it is possible at all to calculate different natural growth rates according to conditions of demand within the economy. We find this very puzzling and unconvincing.

FIGURE 2

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(EPANECHNIKOV KERNEL DENSITY)

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