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PRESS RELEASE

Multivariate structural time series models with dual cycles: Implications for measurement of output gap and potential growth

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Multivariate structural time series models are often used to assess the amount of slack in the economy, i.e. the output gap. They can also provide information on the growth potential of an economy. This is possible since they decompose all factor inputs between cyclical and trend components. Standard models assume independence between the two components. The idea that the cycle could alter the trend is discarded from the outset even though this idea is closely linked to the presence of hysteresis in unemployment. The concept of hysteresis was introduced by Blanchard and Summers, who suggested that a few years of high unemployment could trigger an increase in the average level of unemployment. In this case, the trend in labour input is not independent of the cycle. Hysteresis could be present in other factors as well. Booms and busts in investment may alter the level of the capital stock for a very long time. Similarly, labour market participation rates and hours worked could depend on habits formed during cyclical events.

Standard definitions of output gap and potential growth are ill-conceived once hysteresis is at play. Potential growth figures turn very erratic as hysteresis temporarily modifies the growth prospects. At the peak of the cycle, there is a tendency to overestimate the growth potential, and vice versa at the trough. Moreover, conventional output gap measures tend to underestimate the cyclical impact because the long-lasting influence of the cycle on the output level is not taken into account.

In the paper, the trend plus cycle model is extended to allow for a permanent impact of the cycle on the trend. The cycle may also have a transitory impact as in standard models. The model is labelled a "dual-cycle" model to emphasise the ambivalent nature of the cycle: transitory and/or permanent. It is an extension of Harvey and Koopman's multivariate structural time series model. Rünstler introduced phase shifts into the model. Phase shifts account for leads and lags between the cycles present in the different factor inputs. They are incorporated here as well, not only to account for phase shifts between factor inputs but to allow for phase shifts between the dual effects of a given cycle: transitory deviation or permanent impact on the level of the factor input. New definitions of the output gap and potential growth that take hysteresis into account are introduced.

Applied to Belgian factor inputs, the model identifies two cycle periodicities of 3 and 11 years. Over the 1983-2005 period, the hysteresis coming from the 3-year cycle is rather limited. Deviation cycles without permanent impact dominate in total factor productivity (TFP) and hours worked. Unemployment is an exception but its 3-year cycle only explains a small part of the unemployment fluctuations. When it comes to the 11-year cycle, things look rather different. Hysteresis now has a marked impact and the long cycle permanently alters the unemployment rate, capital stock, hours worked and labour market participation rate. The exception is TFP. Here, the long cycle is again a pure deviation cycle. It is remarkably close to the investment cycle.

The standard output gap is essentially the deviation cycle in TFP. It is close to the National Bank's business survey indicator. Its amplitude is limited, ranging from -1.7 p.c. to +1.6 p.c. of GDP, and going down over time. If hysteresis is taken into account, the cyclical impact goes up and the gap becomes twice as large. Hysteresis in unemployment is responsible for a large part of the increase.

Inevitably, the standard potential growth rate is strongly affected by hysteresis in unemployment. Once hysteresis is discarded, potential growth becomes much less volatile: the yearly growth rate fluctuates between 1.6 and 2.7 p.c. Thanks to a rise in the population of working age, the potential growth rate remained steadily above 2 p.c. over the last few years of the sample.

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