COMMENTS ON SESSION 1: CYCLICAL ADJUSTMENT

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1. Discussion of "Measuring Cyclically Adjusted Budget Balances for OECD Countries" by Nathalie Girouard and Christophe André

The paper presents a re-estimation and re-specification of the elasticities which underlie the OECD method for calculating CAB's. I think the new estimates are an improvement compared to the previous set of estimates. Especially some country variation that was previously difficult to explain has now been substantially reduced. The OECD approach links the cyclical variation of the budget to the output gap. It essentially proceeds in two steps.

Step 1:
Calculates elasticities of tax receipts and expenditures w. r. t. to tax or expenditure bases.

Step 2:
Calculates elasticities of tax or expenditure bases w. r. t. the cyclical indicator (output gap).

1.1 Elasticities of tax receipts and expenditures w. r. t. to tax or expenditure bases

Here the issue arises whether the degree of automatic stabilisation on the expenditure side is fully taken into account. The OECD only regards unemployment related expenditure as responding in a quasi automatic manner to changes in GDP/employment but not other spending. It does not take into account systematic (but not automatic) responses of other expenditure to the cycle. However, from the estimated cyclical response of expenditure and revenue to GDP ratios to the output gap it seems that there is a cyclical expenditure response which is of the same order of magnitude as the revenue response. Consider for example the following OLS regressions for expenditure and revenues for France and Germany:

Expenditure:

$$\frac{EG}{Y} = g0 + g1 * ygap \tag{1a}$$

Revenue:

$$\frac{RG}{Y} = r0 + r1 * ygap \tag{1b}$$

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Table 1

OLS Estimates of Equation (1a) and (1b)

Country	***g*1**	***r*1**
Germany	–0.31	–0.12
France	–0.51	–0.58

Source: OLS estimates: 1972-2004, annual data.

The estimation results show similar elasticities. Thus there seems to be a systematic expenditure response. In my view it would be interesting to trace this to certain expenditure components. For example, one important element of automatic stabilisation on the expenditure side is probably the government wage bill.

1.2 Elasticities of revenue and expenditure bases w. r. t. the cyclical indicator (output gap)

Concerning these elasticity estimates one can certainly argue that a bias could occur because of endogeneity and omitted variables. Consider for example the link between the wage bill and the output gap as estimated by the OECD and expressed in equation (2):

$$\text{Wage Bill} = a0 + a1 * (Y\text{GAP}) \tag{2}$$

Certainly the output gap is not exogenous w. r. t. the wage bill and the elasticity ($a1$) is probably overestimated. But even if one neglects this problem, there is another Lucas Critique type of problem that seems to apply to these specifications. Equation (2) illustrates this nicely. Notice equation (2) links a nominal variable (the wage bill) to a real variable (the output gap). The elasticity estimate is therefore subject to the monetary policy and exchange rate regime. For example, in a regime where monetary policy accommodates real shocks the elasticity of the wage bill w. r. t. the output gap is likely to be larger compared to a regime with strict inflation targeting. For example, one would expect that countries with looser monetary policy have higher elasticity estimates compared to countries with tighter monetary policy. This is indeed reflected in the OECD estimates, where countries like Greece, Italy, Portugal and Spain, which had relatively high inflation rates in the sample period show by far the highest elasticities. From this a practical problem arises. Various countries have experienced a significant regime shift after entering EMU. It is therefore questionable whether elasticity estimates which are obtained over a pre EMU sample period can still be applied to countries that have joined EMU. To avoid this problem, shorter sample periods seem to be advisable. The new OECD methodology already goes in this direction by using a panel approach which allows shortening the time dimension. It would be interesting in further work to test whether these elasticities converge further for countries belonging to EMU.

2. Discussion of "The Missing Cycle in the HP Filter: Implications for the Measurement of Cyclically-adjusted Budget Balances" by Matthias Mohr

The paper generalises the HP filter by allowing a cyclical component which is not white noise. It is shown that allowing for a better representation of the cycle essentially removes the end point bias of the HP filter. The analysis is quite illuminating in tracing the sources of the end point bias. My discussion will concentrate on the following points. First I will discuss how the TC filter is related to a general univariate filtering problem. Secondly, I have some remarks on the volatility of the trend component and finally I will briefly discuss estimation problems.

Looking at the TC filter from the perspective of a general univariate filtering problem is instructive since it allows to better spot some implicit restrictions which are imposed by the filter. A generally filtering problem usually consists in decomposing an observed series X into a trend (XT) and a cycle (XC) as defined by the following measurement equation:

$$X_t = XT_t + XC_t \tag{1}$$

In order to make the decomposition meaningful the general characteristics of the trend and the cycle must be specified. Usually the trend component is modelled as a random walk with a time varying slope coefficient:

$$XT_t = g_t + XT_{t-1} + \varepsilon_t^T \tag{2}$$

The slope coefficient can possibly be a random walk itself:

$$g_t = \gamma\, g_{t-1} + \varepsilon_t^g \qquad \text{with } \gamma \leq 1 \tag{3}$$

The cyclical component is specified as a stationary AR process:

$$XC_t = \alpha(L) XC_{t-1} + \varepsilon_t^c \tag{4}$$

The TC filter is a special case with the following restrictions. The parameter γ is either 0 or 1, *i.e.* the trend component is either $I(1)$ or $I(2)$. The TC filter prefers an $I(2)$ specification. And the variance of ε_t^T is zero ($\sigma_T^2 = 0$).

Do the data favour an $I(1)$ or an $I(2)$ process? The empirical choice is difficult to make. Generally unit root tests do not reject the $I(1)$ specification but usually $I(2)$ is rejected. The true process could be $I(1)$ with γ close to 1. Generally, the error of using an $I(2)$ process, when the true process is only close to $I(2)$ is small. Though one should be aware that in forecasting the $I(2)$ specification has a stronger tendency to extrapolating the most recent growth trend, while an $I(1)$ model has a stronger mean reverting tendency.

Setting the trend innovation variance equal to zero has potentially stronger implications for the results. Generally, in Kalman Filter exercises, the trend and slope variance is estimated to be positive. The ratio of σ_T^2 to σ_g^2 usually has a significant impact on the volatility of the trend. The volatility usually increases with the size of σ_T^2. However this does not explain why the volatility of the trend component of the TC filter is more volatile than the trend component of the HP filter, since both filters impose the same restrictions. In my view, the difference is due to the signal to noise ratio.

In order to show this I have conducted two experiments with a more univariate Kalman filter model where I impose restrictions on the innovation variance of the cyclical component. In the first experiment I impose a low signal to noise ratio (SNR: 0.009), while in the second experiments I impose a high signal to noise ratio (SNR: 1.195). The following graphs show the results for the two signal to noise ratios.

In my view, the comparison of these two cases shows that the more volatile trend is probably not an intrinsic property of the TC filter but the result of a specific choice of the signal to noise ratio.

Finally, a practical problem arises. How should the parameters be estimated? The paper doesn't offer a very convincing estimation strategy. I would therefore propose an alternative, namely directly applying the Kalman filter. In this case the

Figure 1

Decomposing GDP with a Low Signal-to-noise Ratio
(percent)

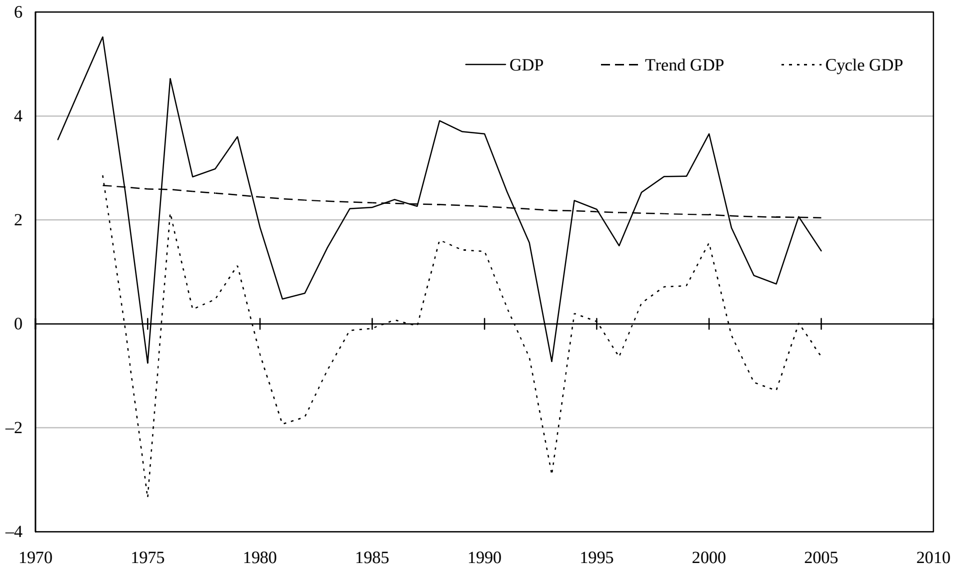
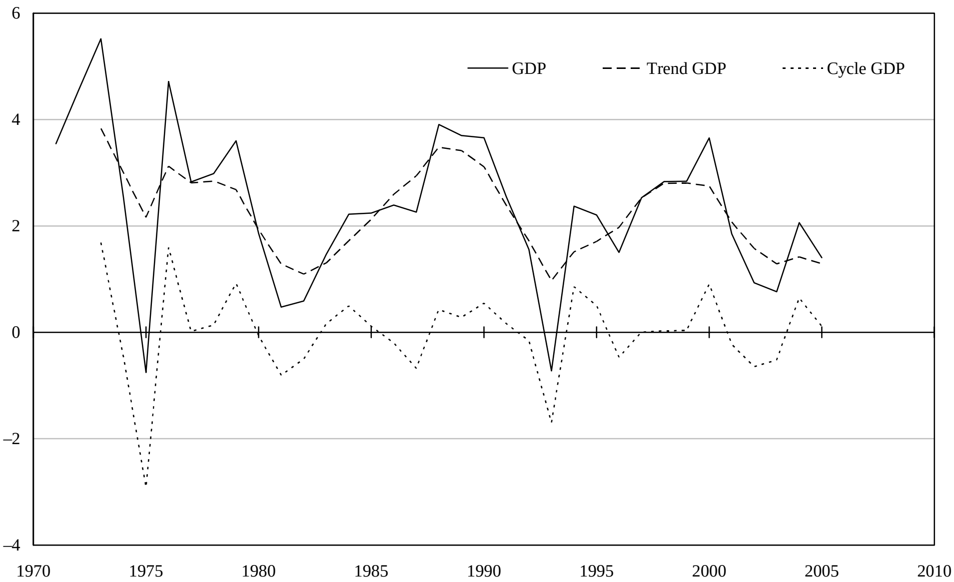


Figure 2

Decomposing GDP with a High Signal-to-noise Ratio
(percent)



parameters of the model can be estimated using maximum likelihood and statistical tests can be made within this framework. It is argued in the paper that this would be difficult from a computational point of view. However my experience suggests that this is only true in a multivariate context, while Kalman Filter estimates are fairly easily obtained in the univariate case.

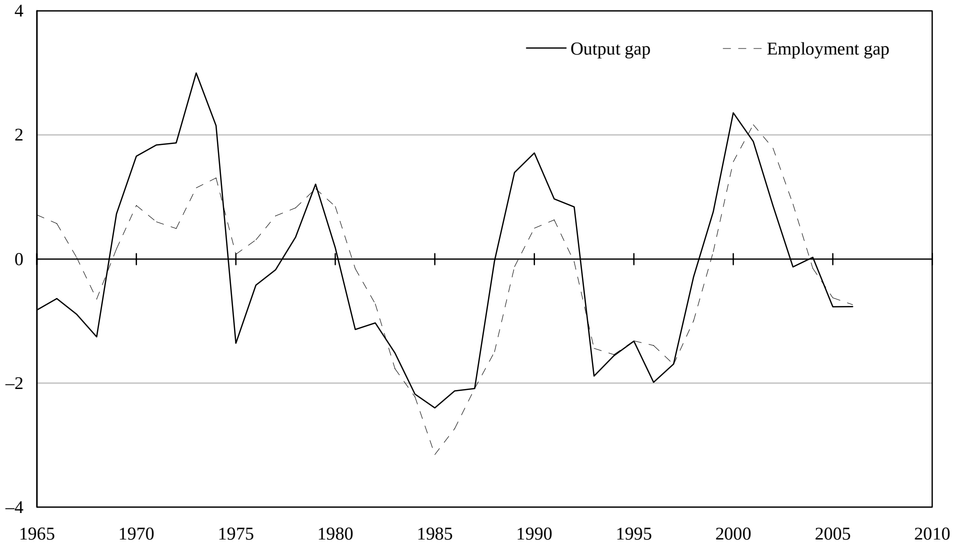
3. Discussion of "Fill the Gap – Measurement of the Cyclical Effect on the Budget" by G.P. Kiss and G. Vadas

The paper tries to combine the production function (PF) and the disaggregated approach for calculating CABs. The aim is to better exploit theoretical relationships among the variables which are used as revenue or expenditure bases in the disaggregated approach. In my view, it is a worthwhile endeavor to merge the two main approaches which are currently in use.

In the PF approach, the output gap is decomposed into gaps of factor inputs, and TFP. In order to link the PF approach to the disaggregated approach the paper suggests decomposing GDP also in its income components (wage and capital income) in order to generate tax bases for capital and labor taxes. In order to obtain a tax base for VAT the paper introduces a consumption function.

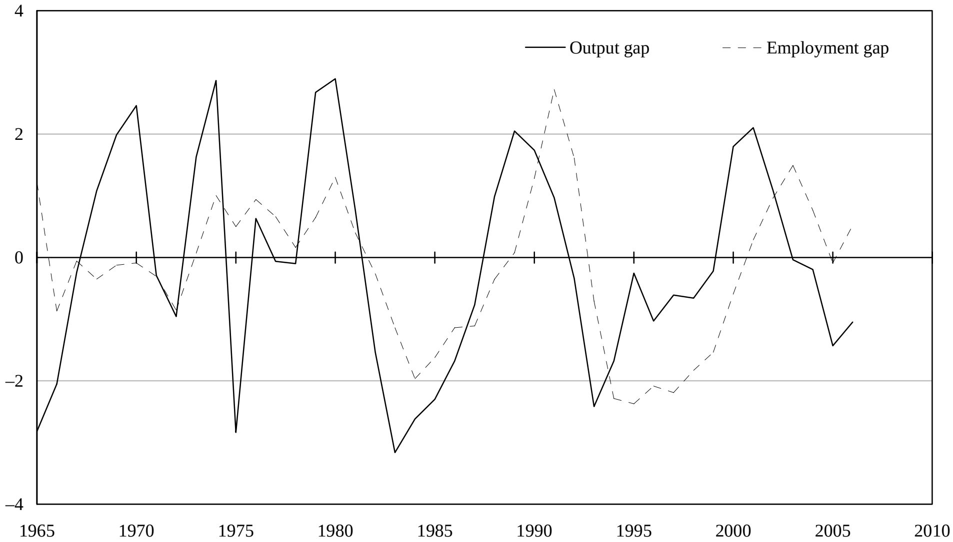
Figure 3

France: Output and Employment Gap
(percent)



Source: DG ECFIN.

Italy: Output and Employment Gap
(percent)



Source: ECFIN.

I also think that the two approaches can be combined, and a logical way to combine them is to decompose income derived from the factor input components into cyclical and trend components of income and to explicitly consider the link between consumption and the income of the individual factors of production. My discussion concentrates on the proposed output gap measure and on the link between consumption and income.

The paper proposes to only use the employment gap as a cyclical measure. A decomposition of TFP into a trend and a cyclical component is regarded as not being necessary. Here I do not follow the claim made in the paper that there are problems of estimating TFP. A consistent measure of TFP can be constructed under fairly general conditions. Also, I want to stress that there are various advantages of decomposing TFP. First, we do not have good measures of the cyclical variation of capacity. In the absence of capacity utilization, the cyclical component of TFP contains fluctuations of capacity utilization. Second, the cyclical component of TFP also contains temporary supply shocks, e.g. oil price shocks, natural disasters, strikes, and systematic sectoral shifts over the business cycle. These are non trivial effects. Standard variance decomposition exercises on GDP growth attribute about 30 to 40 per cent of the variation of GDP to stationary supply shocks. Consequently, the differences between the output gap and the employment gap are not insignificant. In particular, employment gaps tend to be smaller, at least in the first years of the sample and what is probably more important, they seem to lag the output gap as shown by the figures using France and Italy as an example.

My second point is how to link consumption to income and in particular, how to define a permanent and cyclical component of consumption. One has to decompose the individual income components into trend and cyclical components. Here I think the paper is not exploiting fully the information that is provided by the PF method. Elements from the production function could actually provide useful information for such a composition. For example, an important income component is wage income. The production function provides a decomposition of employment into a cyclical and a structural component (NAIRU and trend participation rate) but implicitly also a decomposition of wages into a cyclical and a structural component via the Phillips curve. Unfortunately other income components, in particular profit income and income from financial wealth as well as the wealth effect itself remain difficult to decompose.