



Taking the temperature - measuring the economic cycle in Ireland

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Birds-eye view

- Motivation in Dept. of Finance
- Estimating the supply-side
- Short-comings of ‘harmonised approach’
- Alternative approaches to measuring the cycle
- Conclusions

Motivation for assessing the economic cycle

Economic cycle crucial for Department of Finance...

- **Appropriate design of budgetary policy**
 - short-term demand management
 - avoid pro-cyclicality
 - : ‘boom-bust’
- **Compliance with fiscal rules**
 - SGP 2.0 (2004/05)
 - : preventive arm = MTO, fiscal effort
 - SGP 3.0 (2011)
 - : maintains focus on cyclically-adjusted measures;
 - : fiscal effort in corrective arm also
 - SGP 4.0 (20XX)
 - : ?
 - ‘Fiscal Compact’

The supply-side of the Irish economy

key considerations...

- **Supply capacity = fn.(factor endowment, efficiency)**
- **K and L very mobile in Ireland**
 - challenging to estimate trend factor inputs
- **no standard approach**
 - structural models
 - univariate filtering methods
 - multivariate filtering methods
- **estimates of Y_{pot} vary considerably**
- **no model ‘fits’ at all times**
 - prudent to develop a suite of alternative approaches

Measuring Ireland's cycle – Department's three pillar approach

1. Harmonised methodology (legal requirement)

2. Harmonised methodology – tailored to Irish specificities

- Potential labour
 - migration
 - NAWRU
- Capital
 - composition of stock
 - relaxation of full utilisation assumption
- TFP
 - replace capacity utilisation with PMI (Clancy, 2013)

3. Alternative methodologies

- Borio approach
- Univariate and multivariate filters

pillar 1: harmonised methodology – model specification

- **uniform approach applied on a pan-EU basis**
 - increasingly controversial
 - : “OGWG = most important EU group you’ve never heard of”
 - filtering time-series
 - : end-point problems
- **production function approach**
 - functional form = Cobb-Douglas
 - potential output linked to potential factor inputs (K,L) and TFP

$$: Y_{pot} = (L_{pot}^{0.65} * K^{0.35}) * TFP_{pot}$$

$$: output_gap = 100 * ((Y - Y_{pot}) / Y_{pot})$$

$$: \delta Y_{pot} = 0.65 * (\delta L_{pot}) + 0.35 * (\delta K) + \delta TFP_{pot}$$

Pillar 1: harmonised methodology

- factor inputs exogenously determined

- labour input

$$L_{\text{pot}} = \text{POP}_{15-74} * \text{trend participation rate} * (1 - \text{NAWRU}) * \text{trend hours}$$


trend Labour force

trend workforce

trend labour input

- capital input

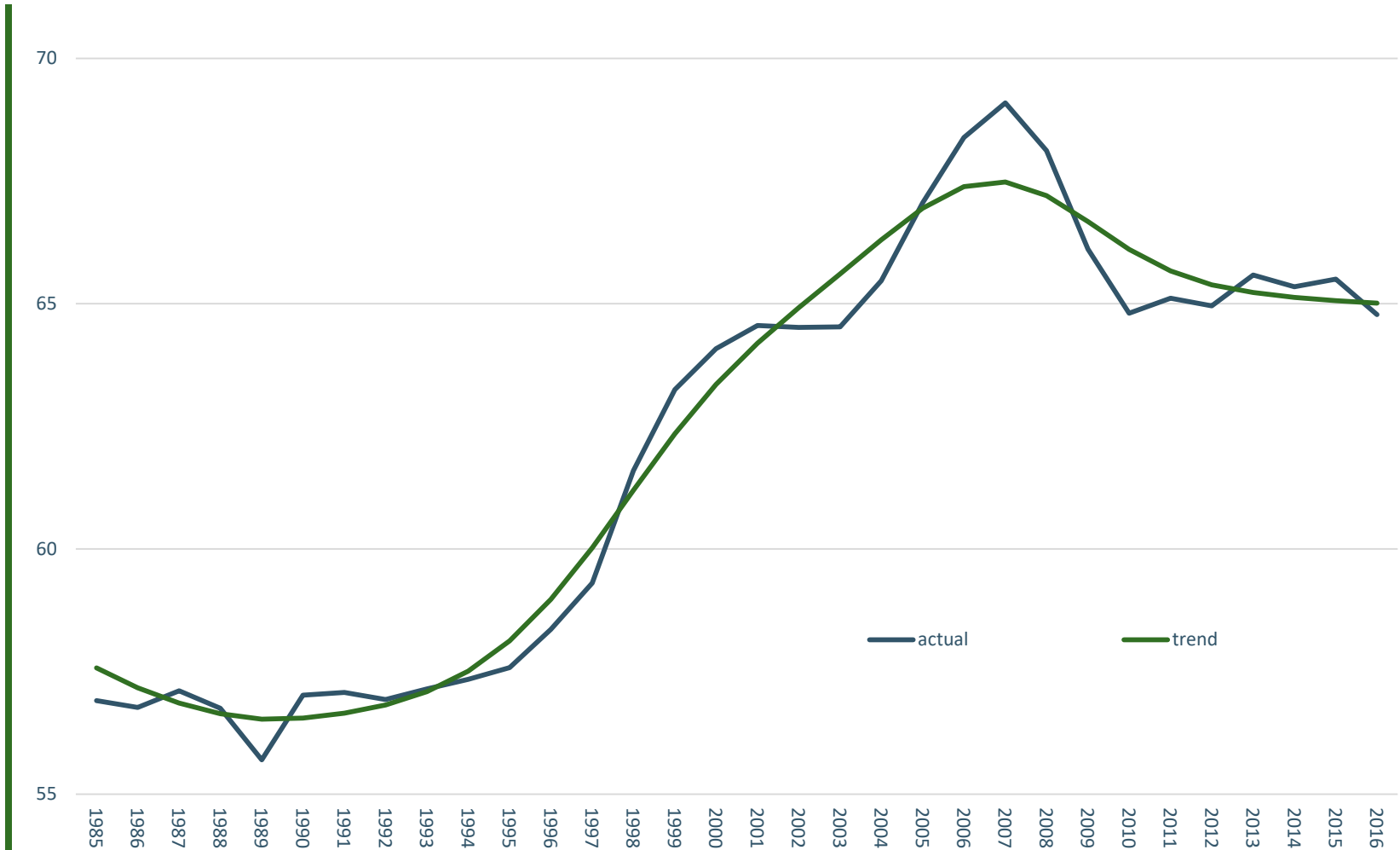
$$K = \text{actual capital stock, i.e. full K-utilisation assumed}$$

$$= K_{t-1} + I_t - \text{dep}_{t-1} \text{ (perpetual inventory method)}$$

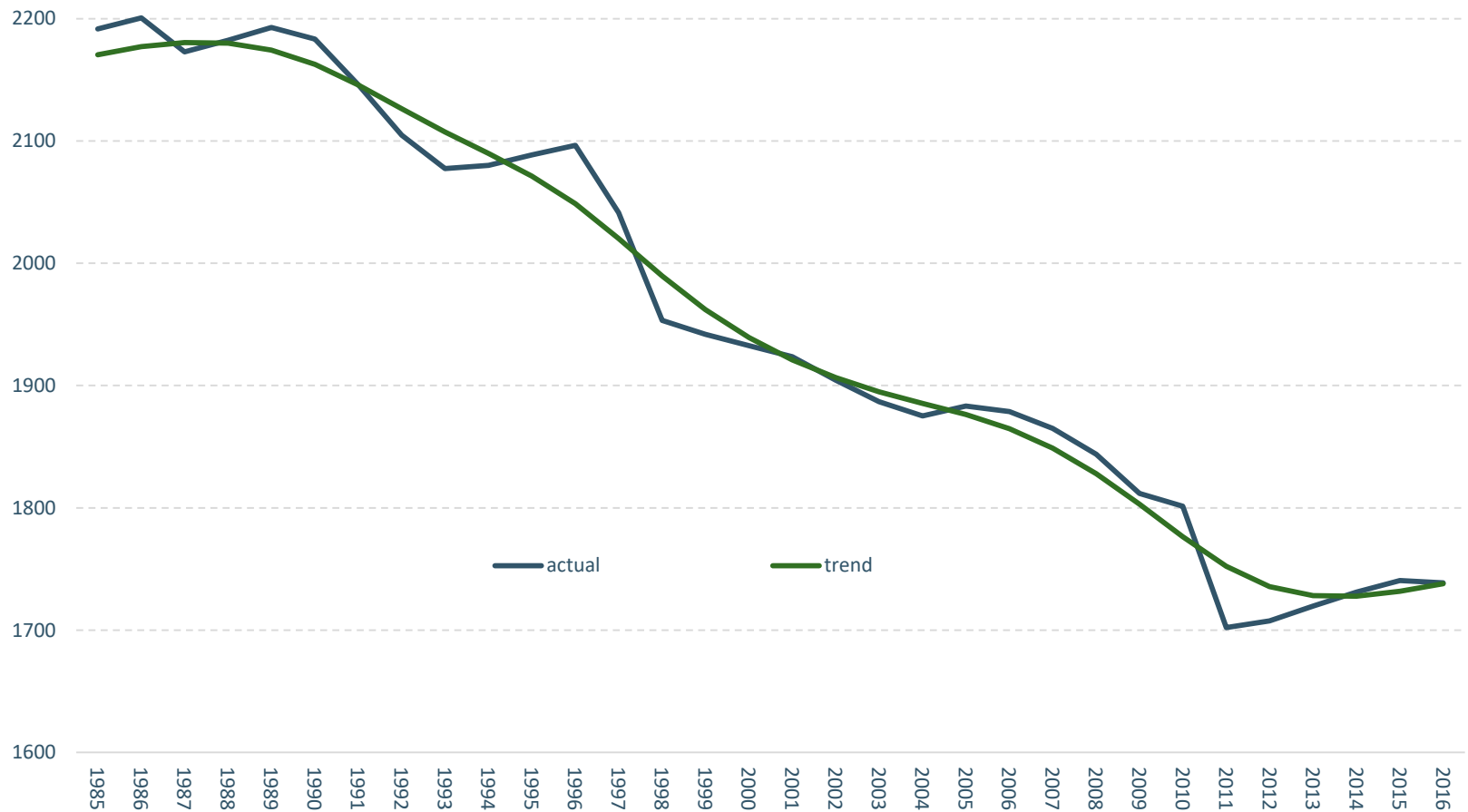
- total factor productivity input

$$TFP_{\text{pot}} = \text{trend TFP (trend-cycle decomposition derived CU indicators)}$$

Actual and trend participation rate...



Actual and trend hours worked (per worker, per annum)...



Harmonised methodology ... move towards greater flexibility

- **Harmonised approach fails to account for country specificities**
 - counter-intuitive output gap estimates
 - “one-size does not fit all”
 - undermines confidence in policy recommendations
- **Economic Policy Committee adopted new procedure**
 - country-specificities
 - proposals evaluated by OGWG / Commission
 - supports efforts to produce economically intuitive estimates
 - economically and politically ring-fenced
 - increase confidence in policy recommendations

Deriving NAWRU estimates

- **Bivariate Kalman filter**
 - Unemployment rate (U) decomposed into:
 - : trend unemployment rate (T)
 - : unemployment gap (C) [cyclical component of unemployment]
 - Phillips curve added
 - : changes in real wage inflation = fn. (cyclical component of une rate (C))
 - Unemployment rate estimates consistent with stable wage inflation
= NAWRU

Estimating labour market (dis)-equilibrium...

- **Phillips curve**

- unemployment rate consistent with stable wage inflation
= NAWRU
- extracted using actual unemployment and wage inflation
- estimated using bi-variate kalman filter

- **Signal Equations**

New Keynesian Phillips Curve

$$\Delta\pi_t^w = \mu^w + \beta_1(U_t - U_t^*) + \beta_2(U_{t-1} - U_{t-1}^*) + \gamma X_t + Dummy_{2015} + Dummy_{2016} + u_t$$

Decomposition of unemployment rate

$$U_t = U_t^* + C_t$$

- **State Equations**

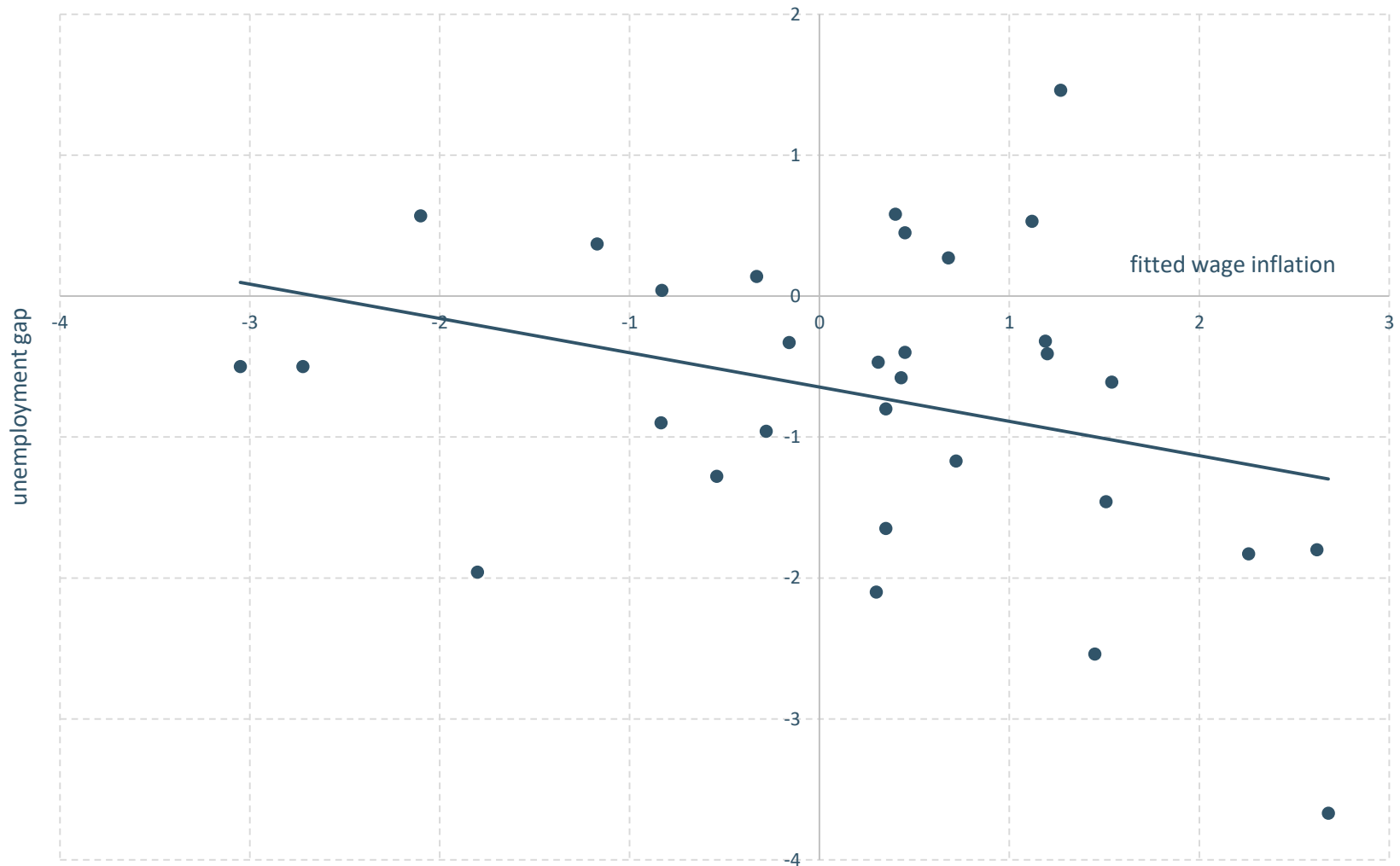
$$U_t^* = U_{t-1}^* + \mu_{t-1} + z_t$$

$$\mu_t = \mu_{t-1} + a_t$$

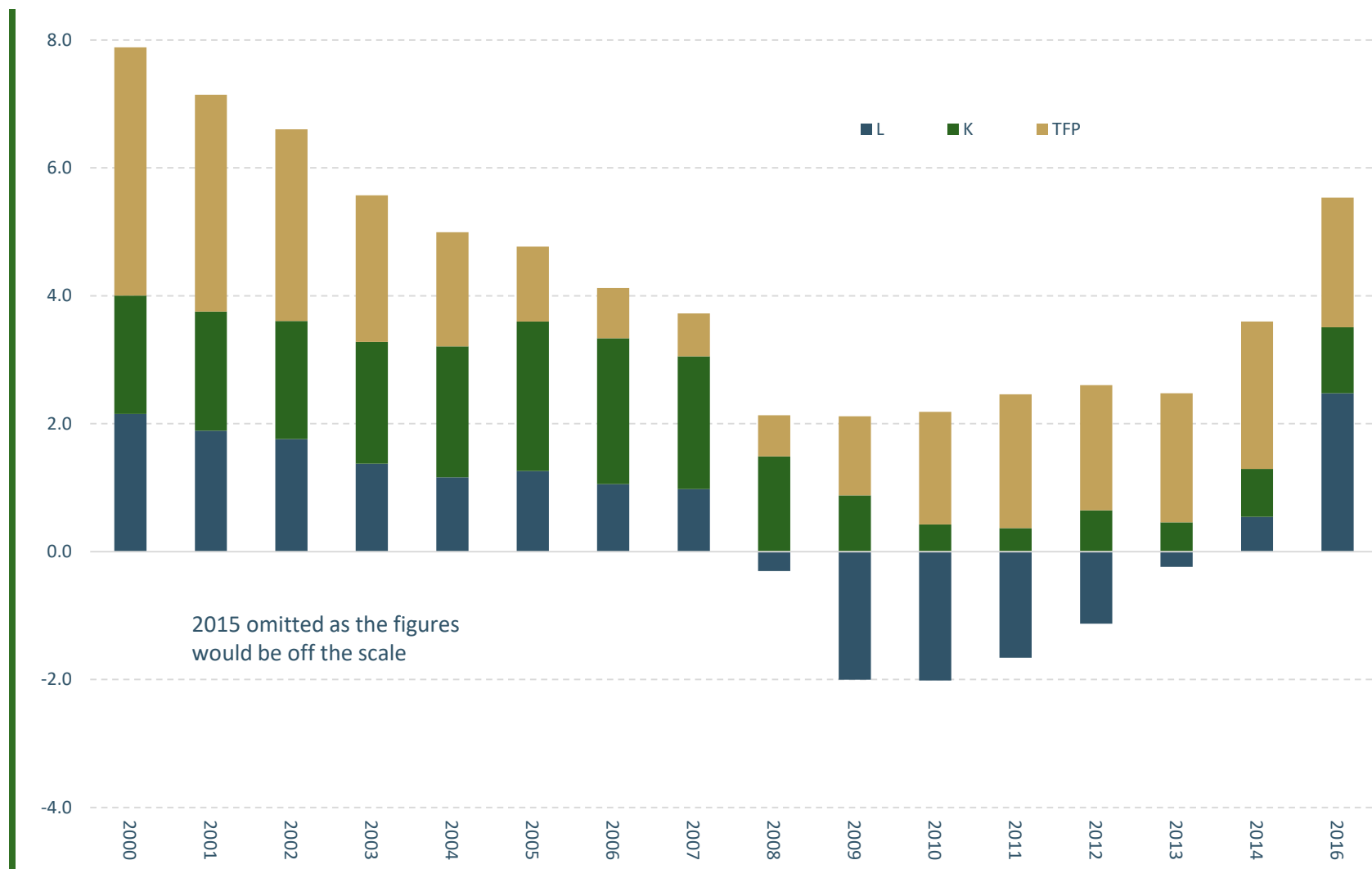
$$C_t = \phi_1 C_{t-1} + \phi_2 C_{t-1} + v_t$$

$\Delta\pi_t^w$	Change in real wage growth
U_t	Unemployment rate
U_t^*	NAWRU
μ_t	Drift term
X_t	Exogenous variables - ddtot
u_t, z_t, a_t, v_t	Uncorrelated, normally dist. errors

Unemployment gap and wage inflation



Putting it all together: contributions to δY_{pot} ...

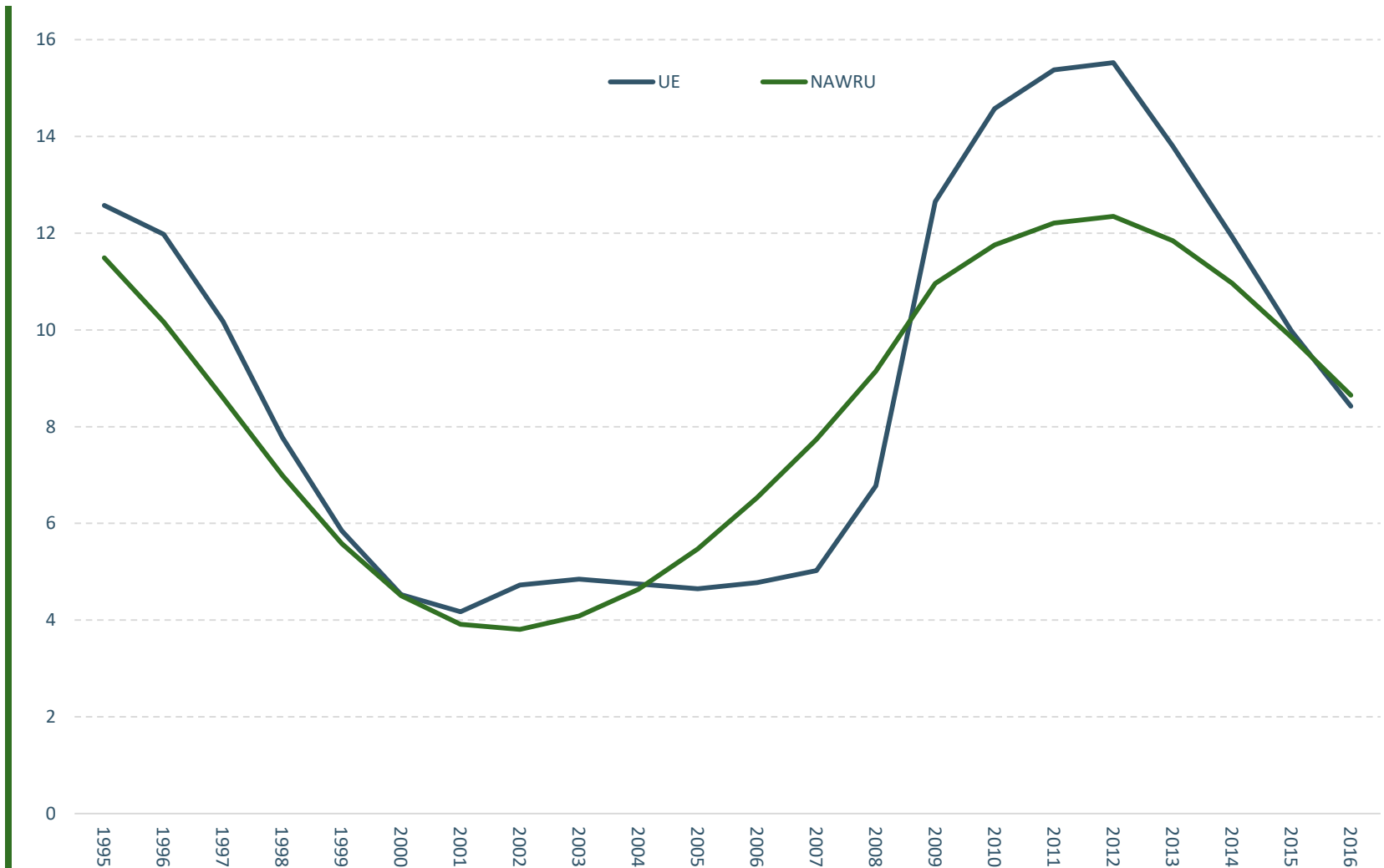


Short-comings of harmonised approach

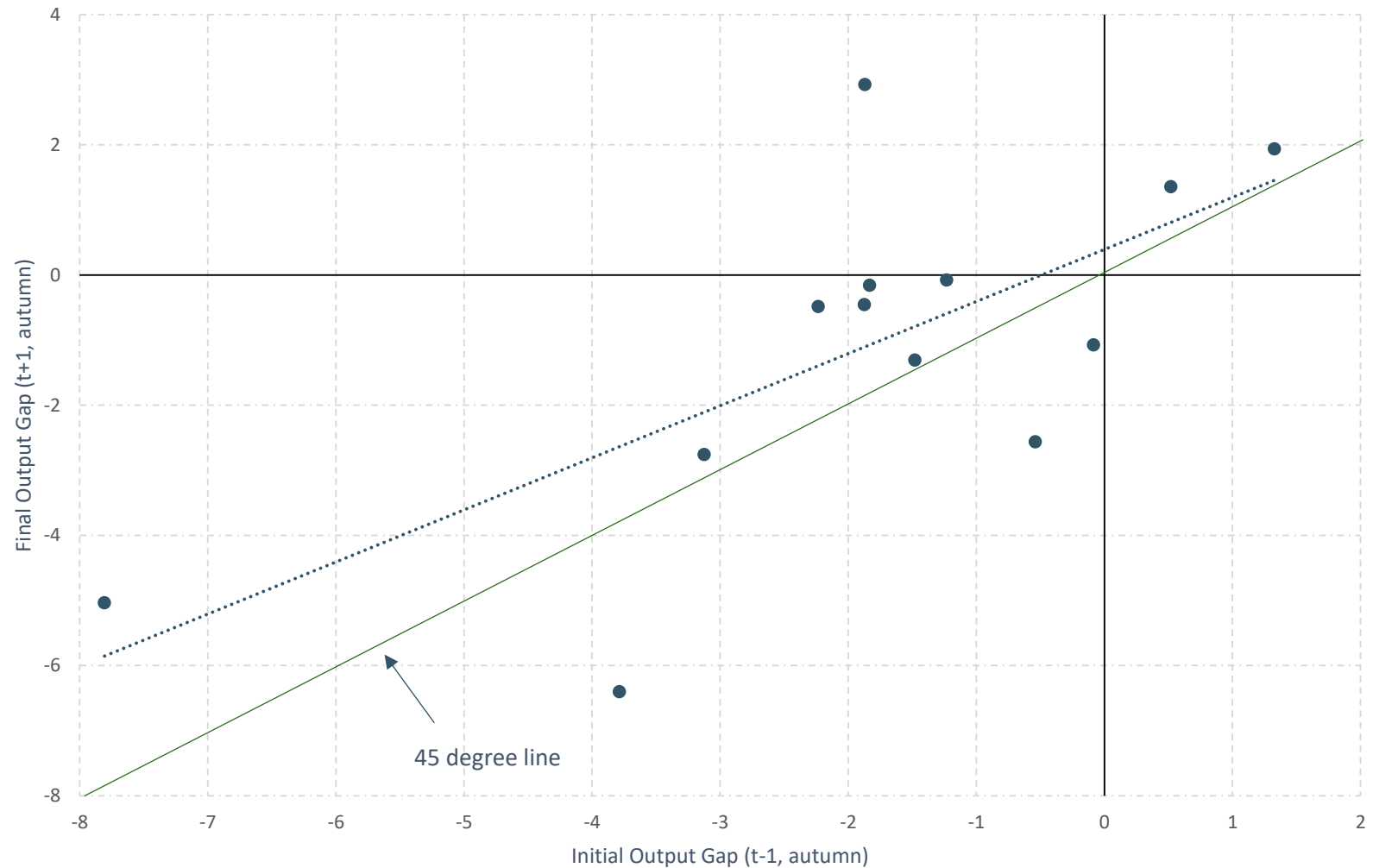
Short-comings of harmonised approach...

- **Pro-cyclicality of potential output**
 - endogeneity of labour supply
 - : participation rates
 - : migration channel
 - : NAWRU remains an elusive concept
 - major problem at turning points
- **Real-time estimates subject to large revisions**
- **Product market imbalances ignored**
 - focus is purely on factor market imbalances

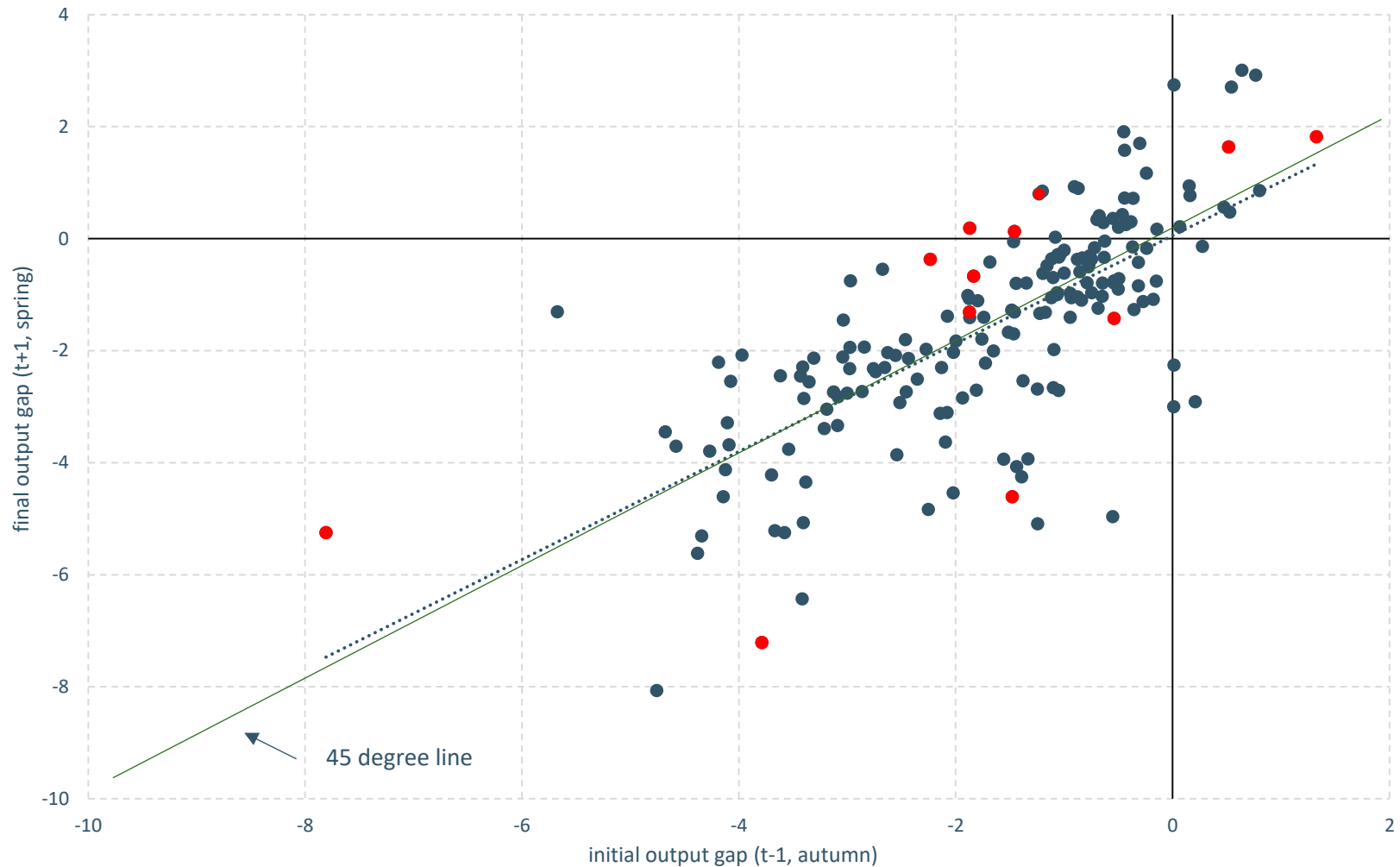
NAWRU : elusive concept in Irish context and pro-cyclical...



Irish output gap revisions can be significant...



Output gap revisions for EU14 ('old' MS exc. EL)



Revisions > “fiscal effort” under preventive arm...

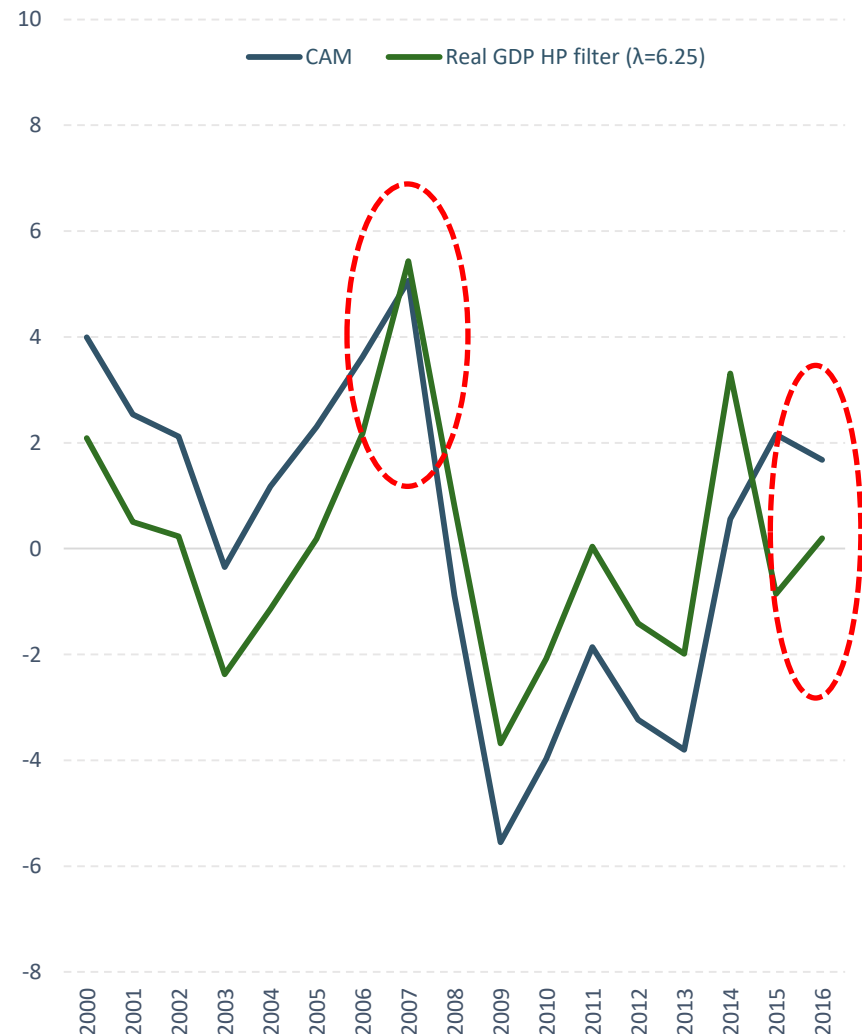
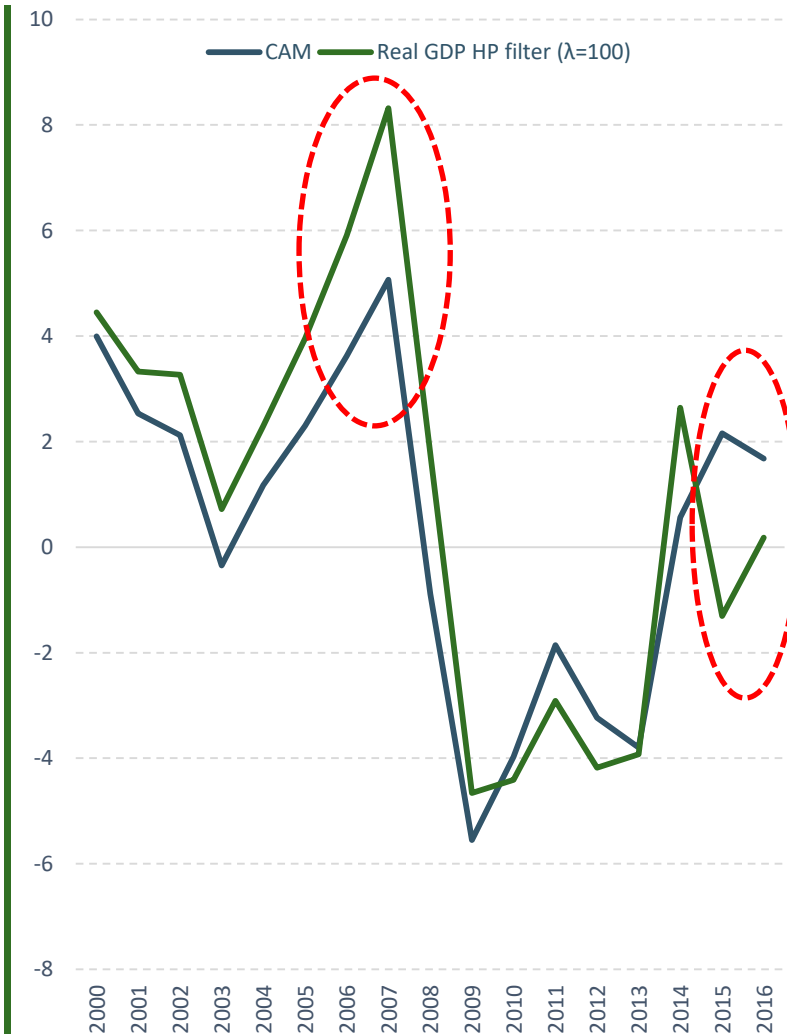


Alternative models

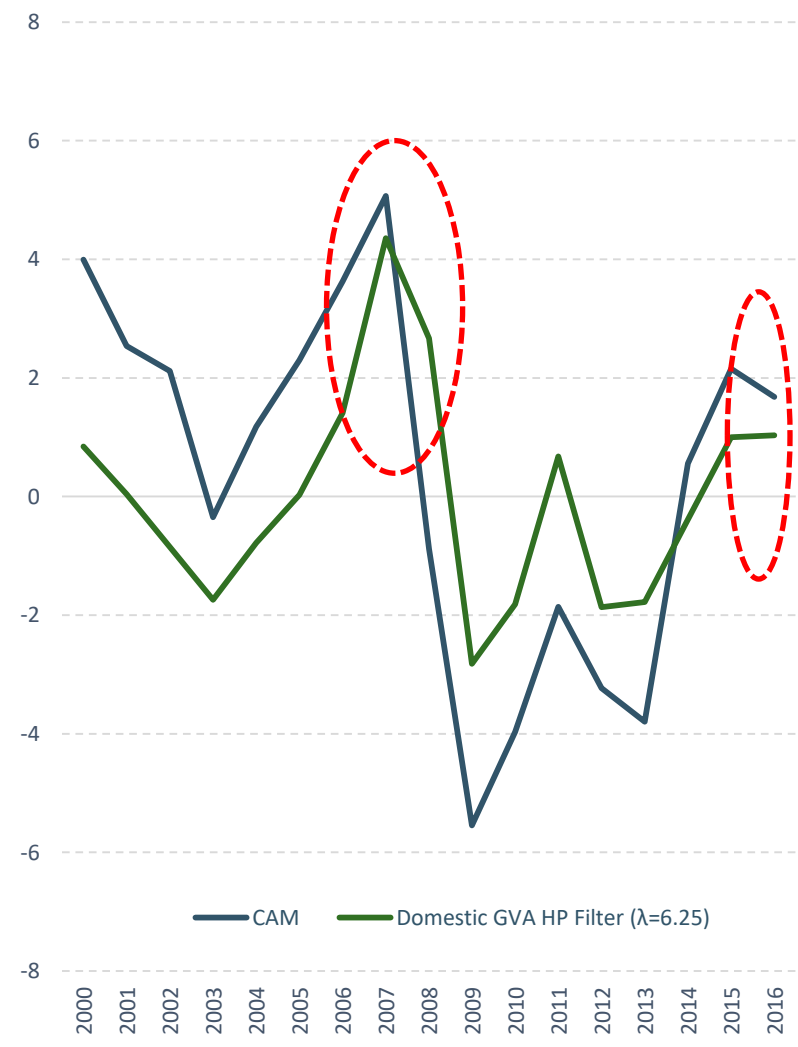
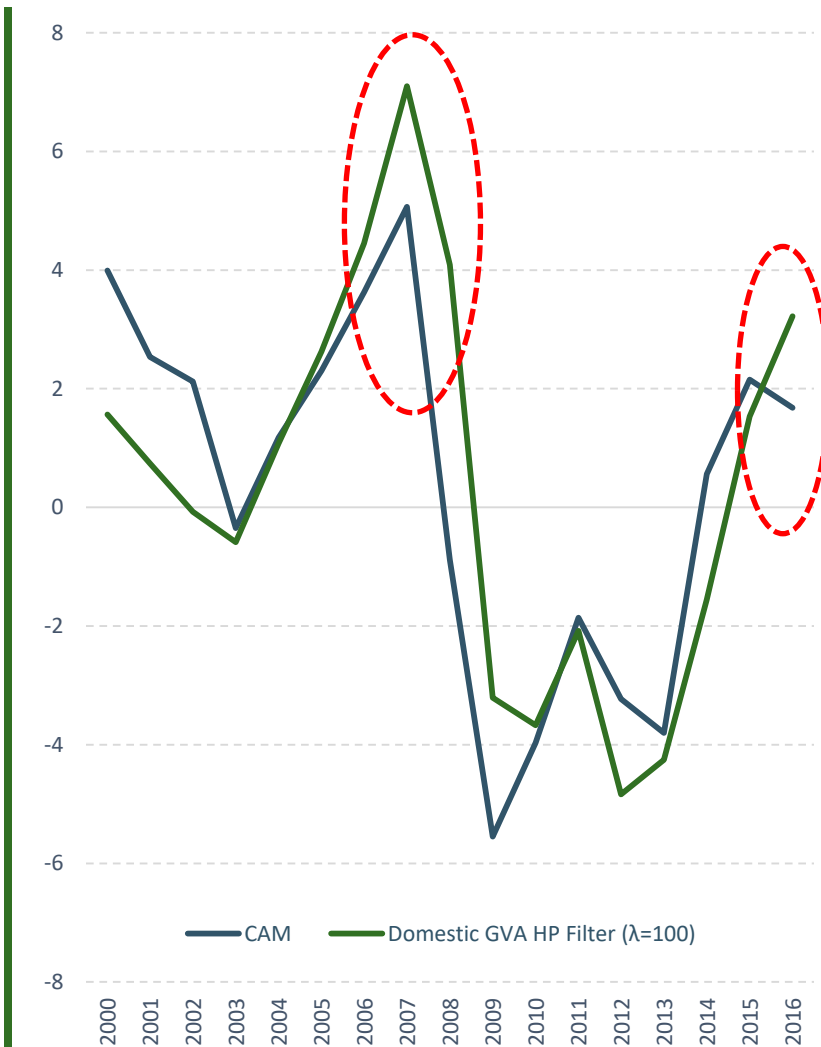
Alternative models of the supply side...

- **Pure filtering**
 - trend-cycle decomposition using HP-filter
 - atheoretical
- **Adjusting production function approach**
 - adjusting for capital gap
 - replacing CUBS series with PMI (Clancy, 2013)
- **‘Borio’ model**
 - finance-neutral
 - : controls for impact of financial channels
- **Adjusting for impact of MNCs**

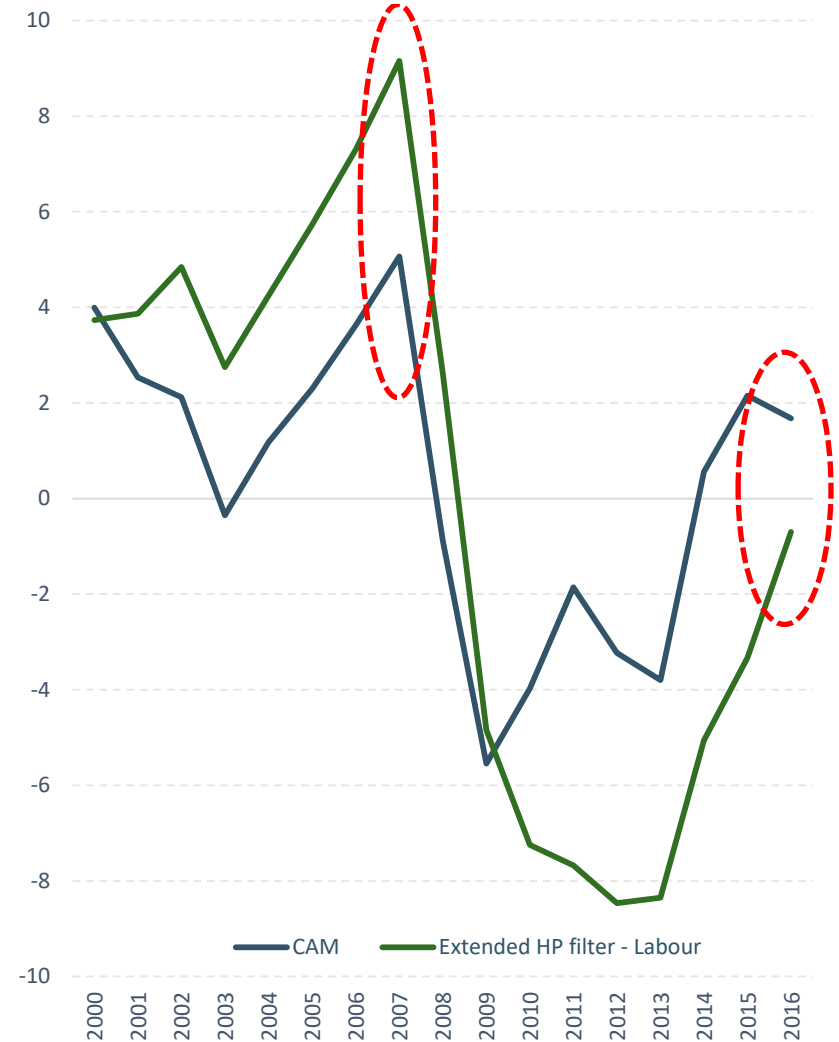
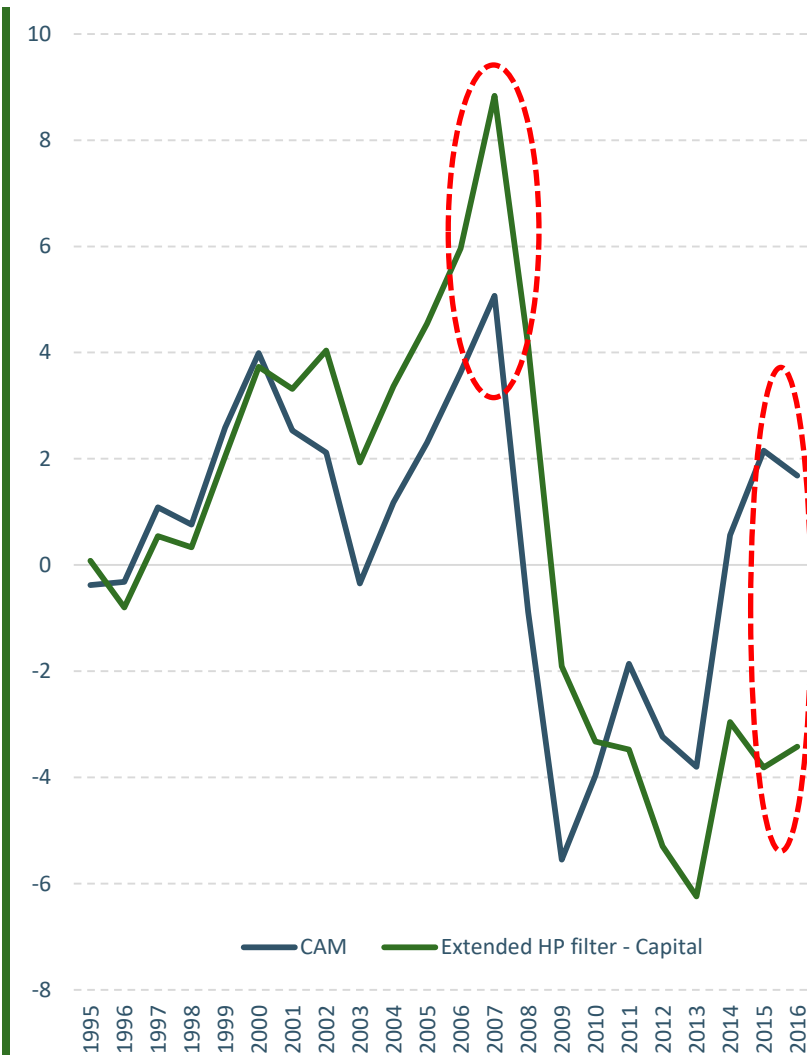
Alternative output gap measures : univariate filtering



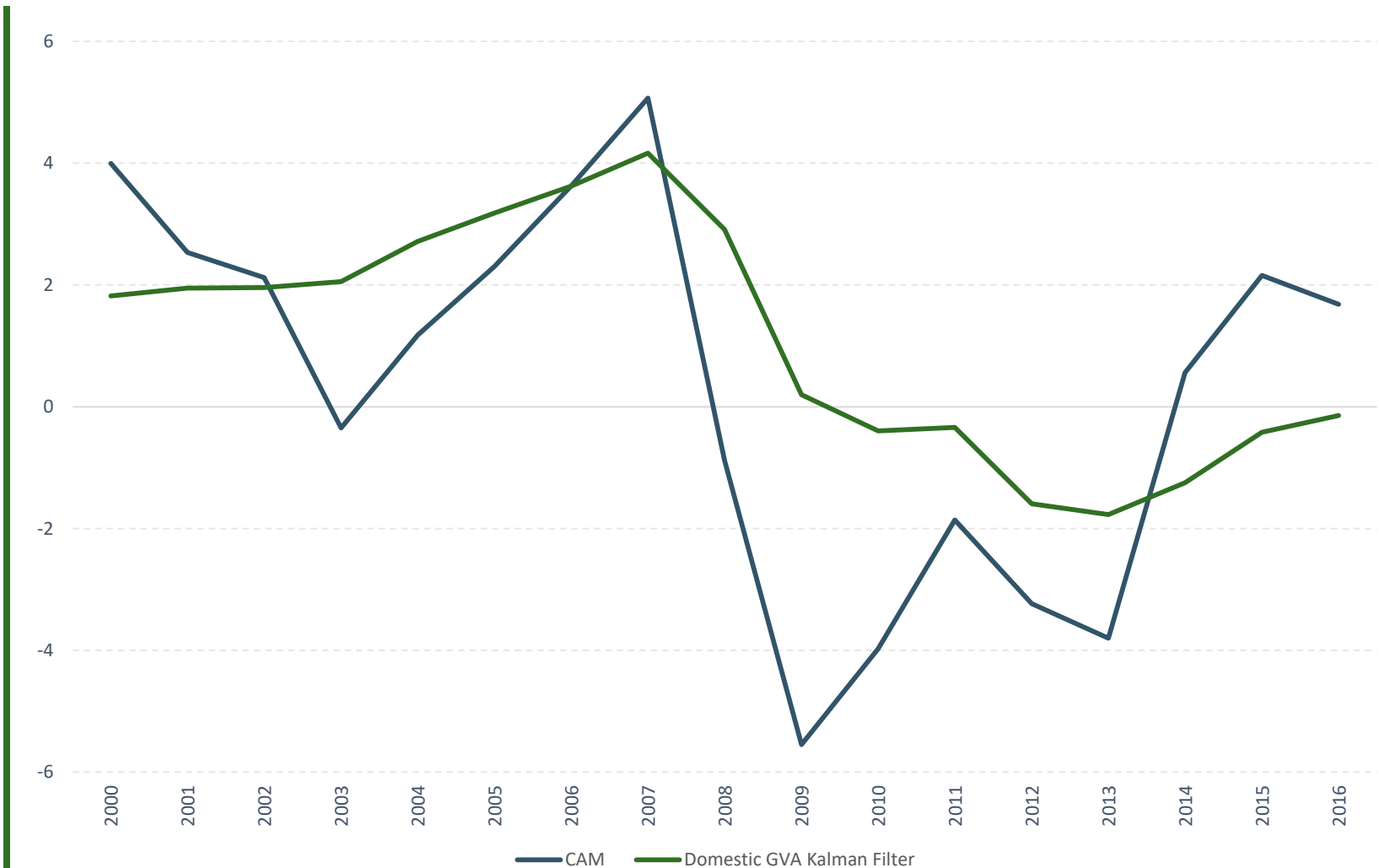
Alternative output gap measures : domestic GVA



Alternative output gap measures : finance-neutral



Alternative output gap measures



conclusion

conclusion...

- **Estimating potential output**
 - more of an art than a science in Ireland
- **Many plausible approaches**
 - significantly different results
 - misleading signals / counter-intuitive results
 - one-size does not fit all
 - country specificities can now be incorporated
- **Important policy implications**
 - policy prescriptions can be inappropriate
 - : especially given size of revisions
 - compliance with rules jeopardised
 - : policy on the basis of unobservable variables