Office for Budget Responsibility

The use and estimation of output gaps

November 2012

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Overview

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(2) Using the output gap

(3) Estimating the output gap

(4) Recent applications

(5) Concluding remarks

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1. About the Office for Budget Responsibility (OBR)

- OBR created in 2010 to produce independent analysis of the UK's public finances
- Main roles:

  (a) Forecasts for the economy and public finances: 5 year forecasts, twice-yearly in Economic and Fiscal Outlook

  (b) Judge progress towards the Government's medium-term fiscal targets:

  (i) Balance the cyclically-adjusted current budget five years ahead

  (ii) Public sector net debt falling in 2015-16

  (c) Assess the long-term sustainability of the public finances: Annual Fiscal Sustainability Report (FSR)

  (d) Scrutinise Treasury costing of Budget measures

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2. Using the output gap

- **5 year economic forecast:** need to know what the economy's potential is, and where the economy is relative to that potential

- **Cyclically-adjusted fiscal mandate:** assess likelihood that the Government will meet its target to balance the cyclically-adjusted budget balance five years ahead

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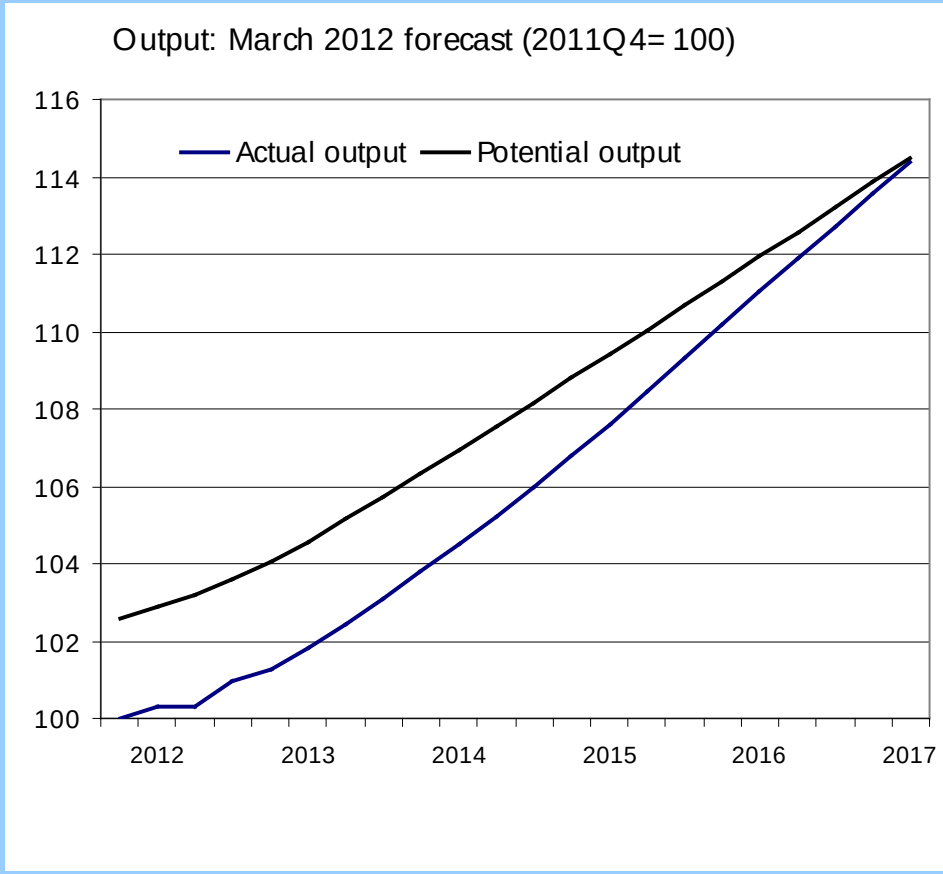
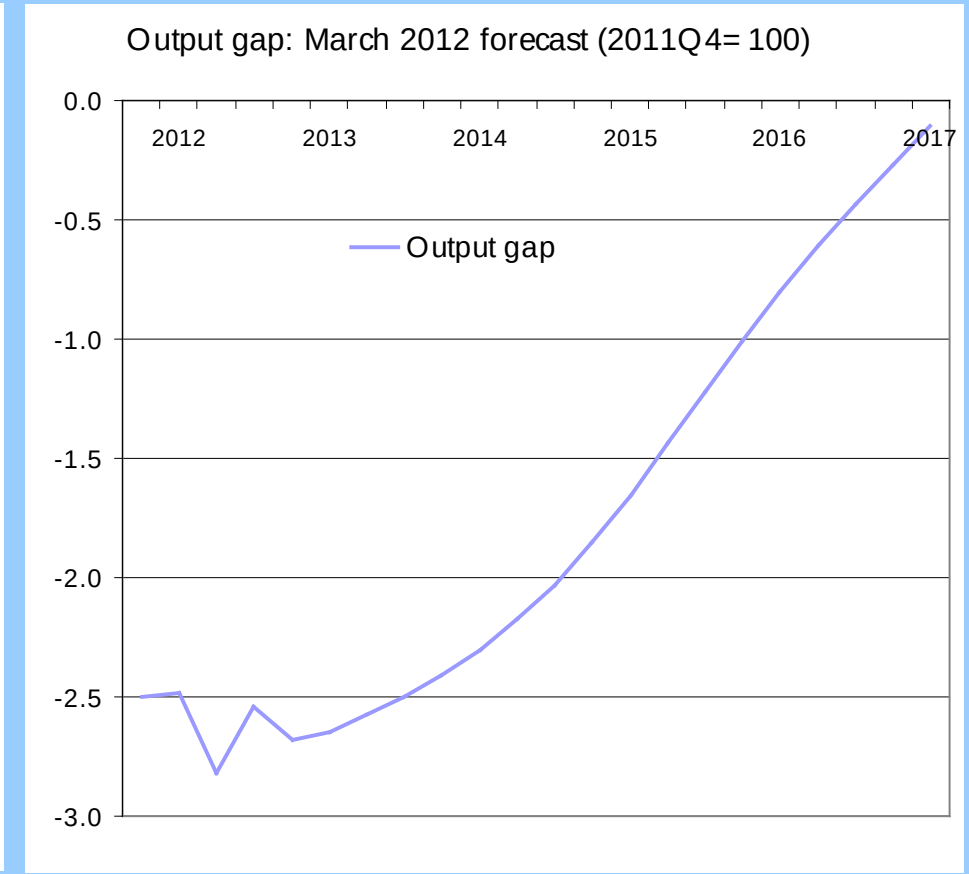
2. Using the output gap





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2. Using the output gap

- Working paper No 3 *('Cyclically adjusting the public finances'):* sets out estimation of cyclical adjustment parameters
- Used variety of different approaches to assess the sensitivity of the public finances to the cycle
- Preferred parameters:

Cyclically-adjusted public sector net borrowing (PSNB)=Actual PSNB + 0.5*output gap (t) + 0.2*output gap (t-1)

•Estimate of output gap directly determines estimate of cyclically adjusted budget balance

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2. Using the output gap

- *Economic and Fiscal Outlook* includes sensitivity analysis of the cyclically-adjusted budget balance to output gap estimate

Output gap in 2011Q4 (per cent)	Cyclically-adjusted budget balance in 2016-17 (per cent)
-0.5	-1.0
-1.5	-0.3
-2.5	**0.5**
-3.5	1.2
-4.5	1.9

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3. Estimating the output gap

- Prior to June 2010, UK Treasury responsible for economic forecast, including output gap and potential output estimates
- Treasury approach based on “cycle-dating” methodology:
  - Cyclical indicators (survey data, wage growth) used to determine when the economy was at its potential level (i.e. the start/end and mid points of the economic cycle)
  - Potential output assumed to grow at a constant rate between start/end and mid points of the cycle
  - Potential output then projected forward from latest on-trend point, based on assumptions about growth of components

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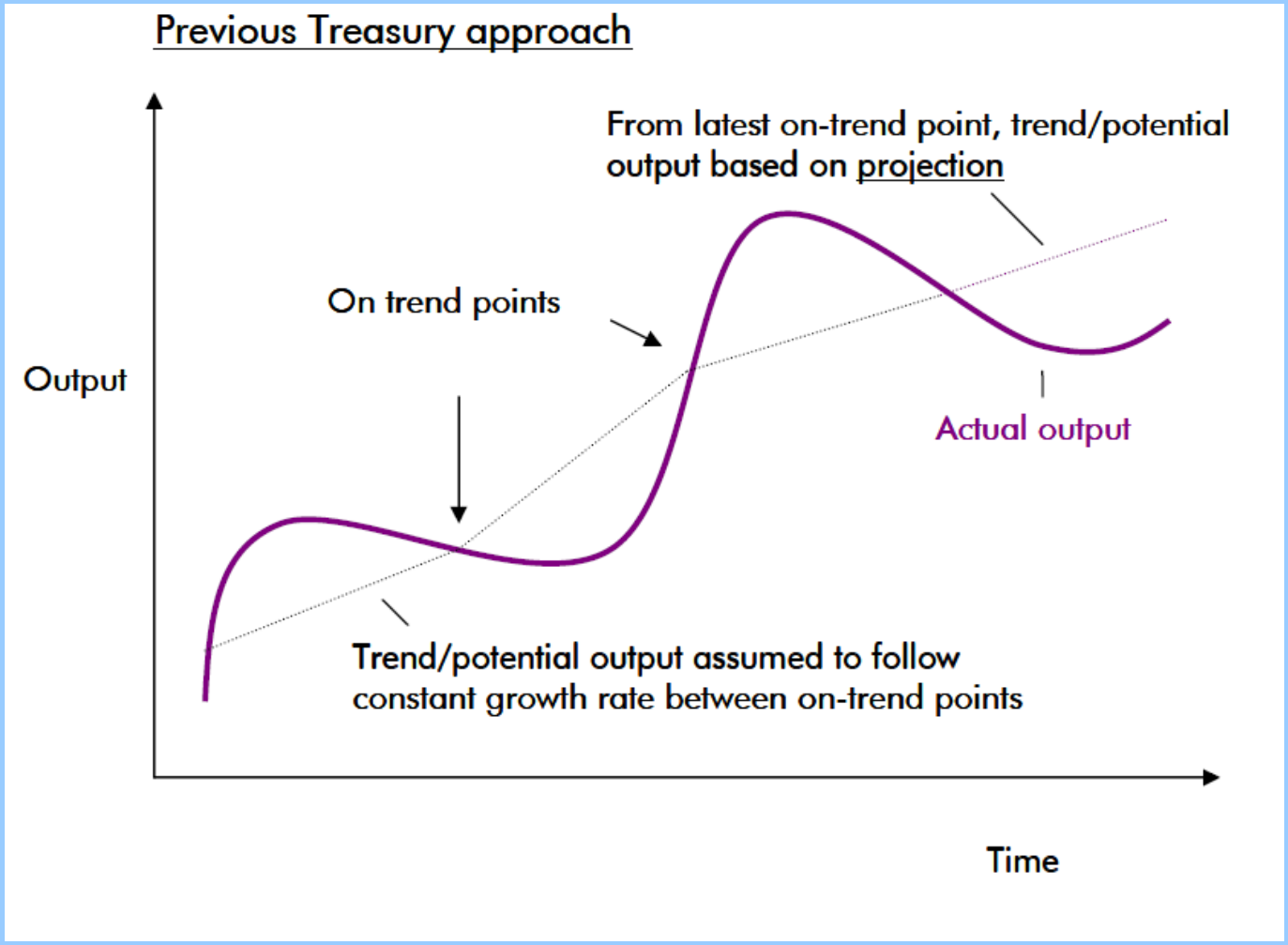
3. Estimating the output gap



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3. Estimating the output gap

- Financial crisis 2008/09 – significant uncertainty around the impact of the crisis on potential output/output gap
- Two possible approaches:
  1. Directly estimate the adjustment to potential output; output gap then “falls out”
  2. Directly estimate the output gap using indicators of spare capacity; potential output estimate then “falls out”
- Since June 2010 – OBR has used second approach, using a range of cyclical indicators
- Similar to “EUROCOIN”-real time coincident indicator of the euro area business cycle

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3. Estimating the output gap

- Cyclical indicators:
  - Survey indicators of capacity utilisation and recruitment difficulties across manufacturing and services
  - Real wage growth
- To map to output gap, use two methods:
  - **Aggregate composite**: a weighted average of survey indicators, with weights determined by shares of income/output
  - **Principal components**: a statistical technique used to weight together both survey and non-survey indicators

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3. Estimating the output gap

Issues:

- Normalisation:
  - indicators transformed so that they are in standard deviation from “normal” levels.
  - in most cases, “normal” levels based on whole sample average
  - elsewhere, normal levels based on average over normally distributed period.
- Data availability:
  - Many surveys only have a limited time span
  - Historical series based on split sample (1972-1995; and 1995-2012)

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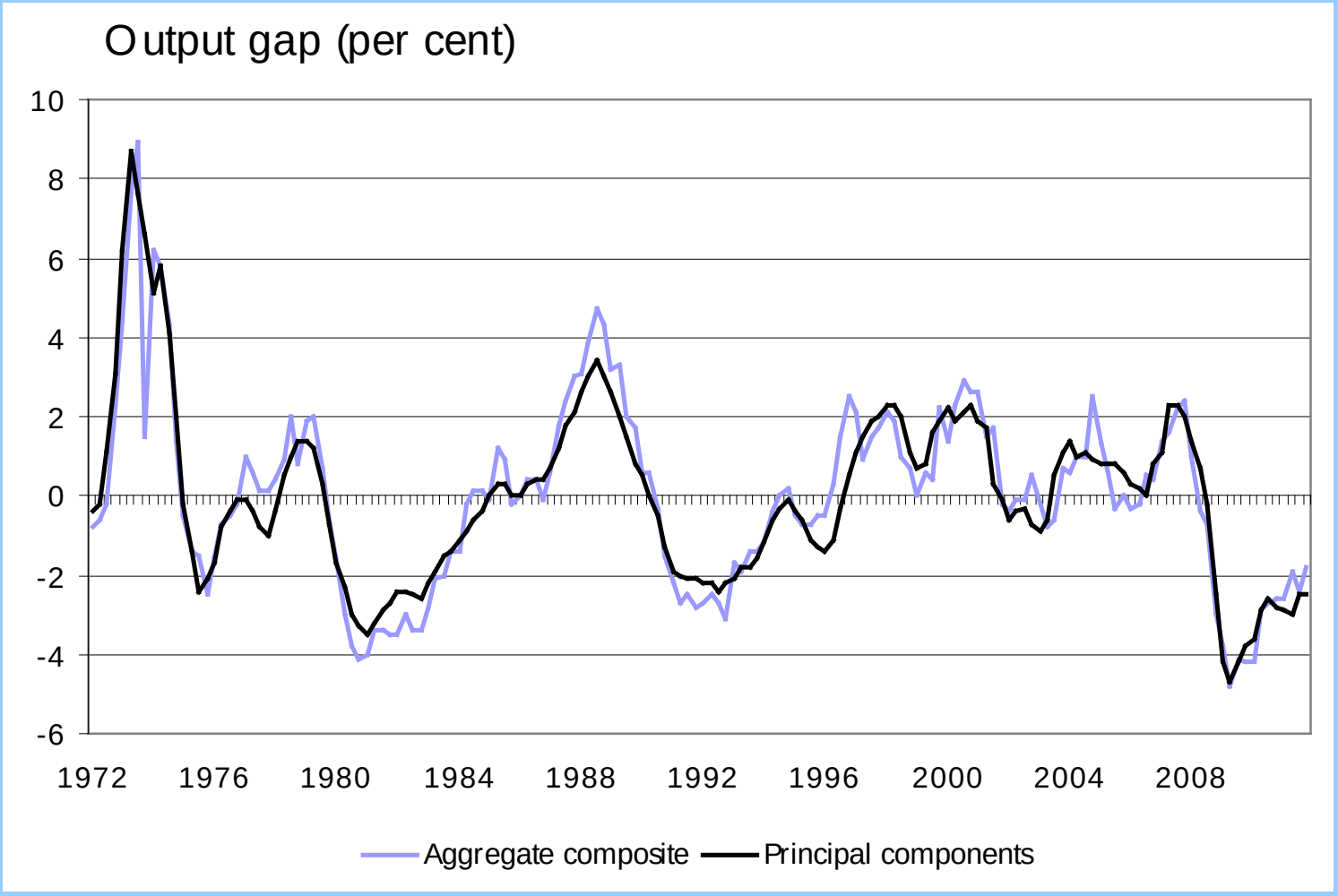
3. Estimating the output gap



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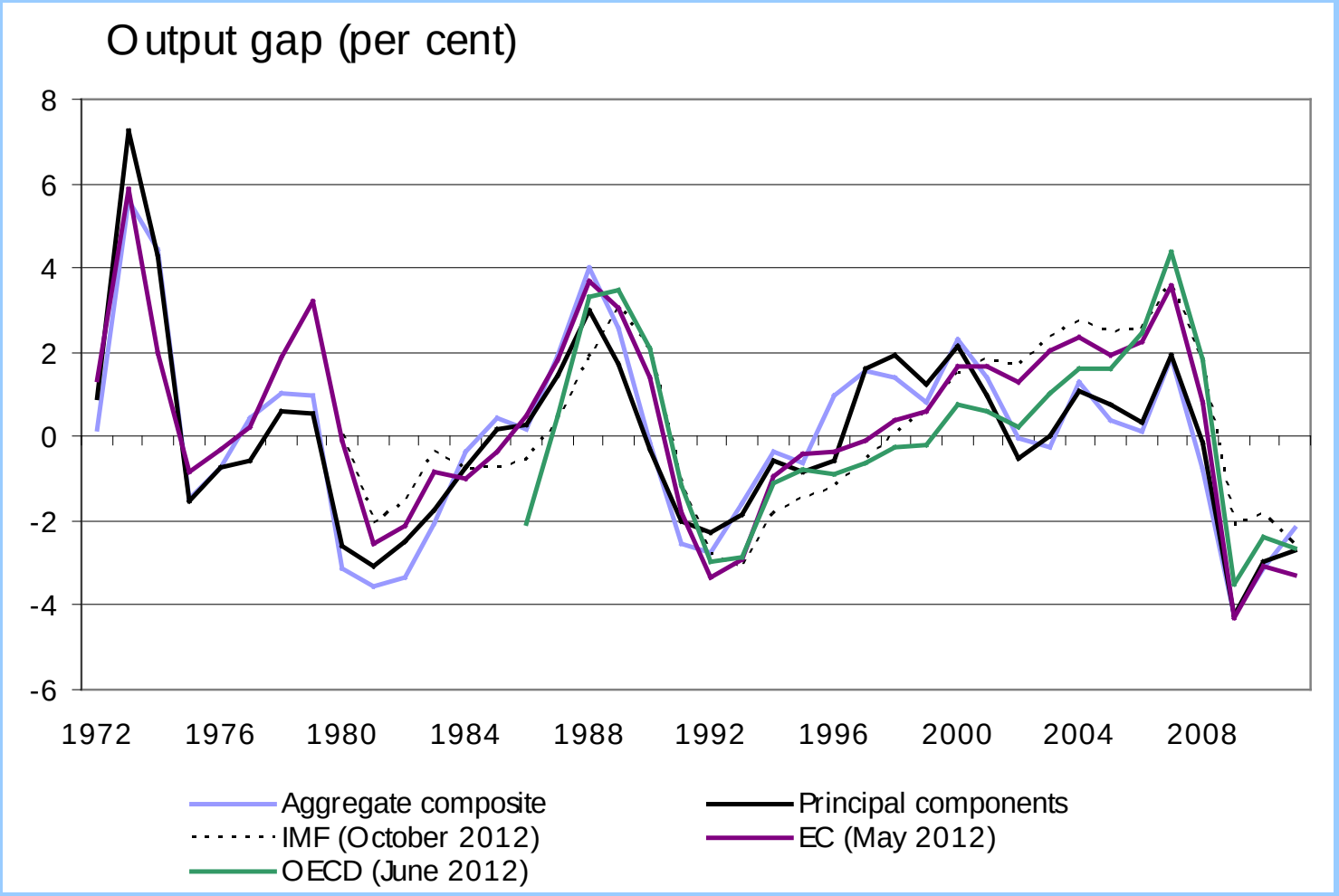

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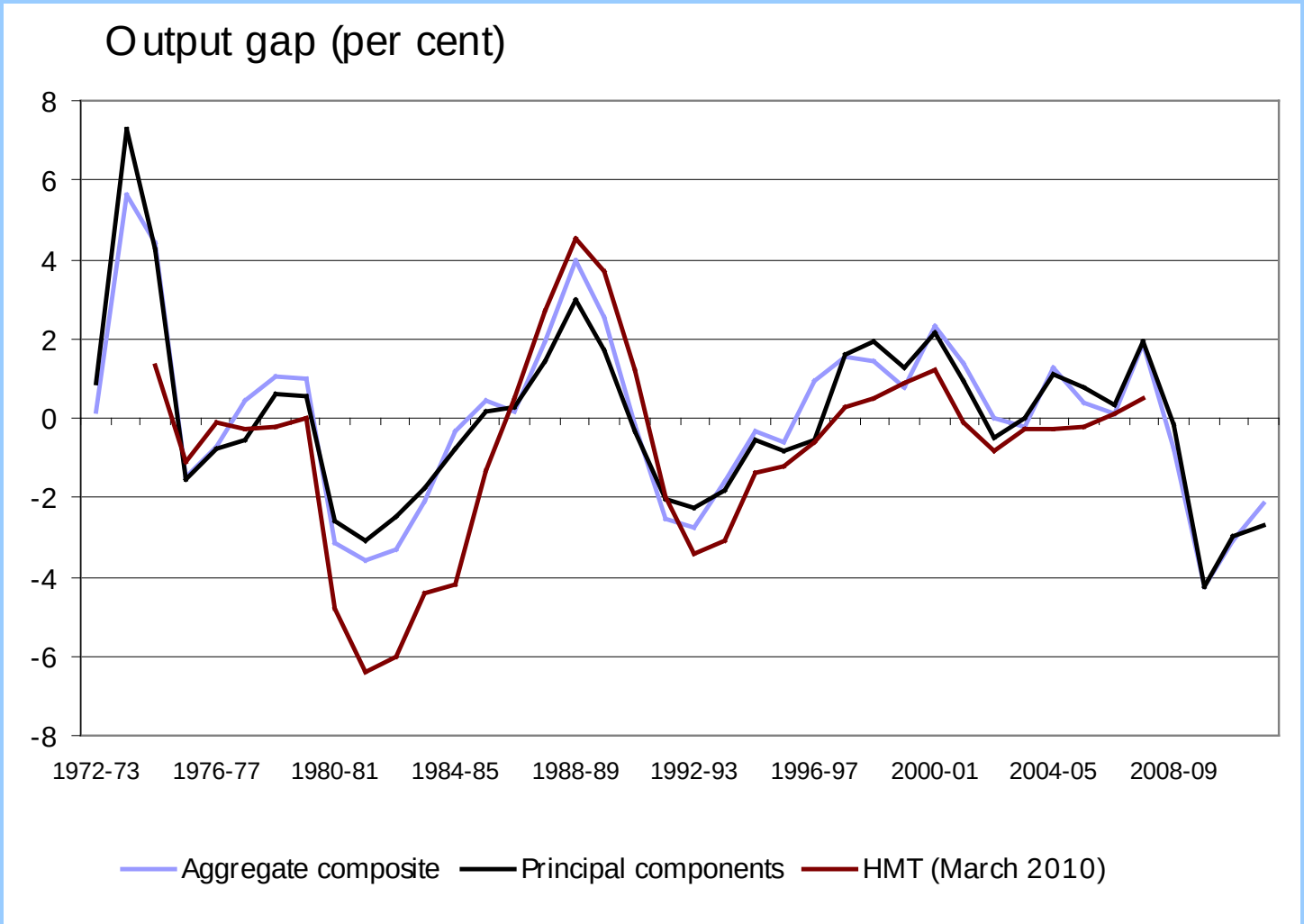

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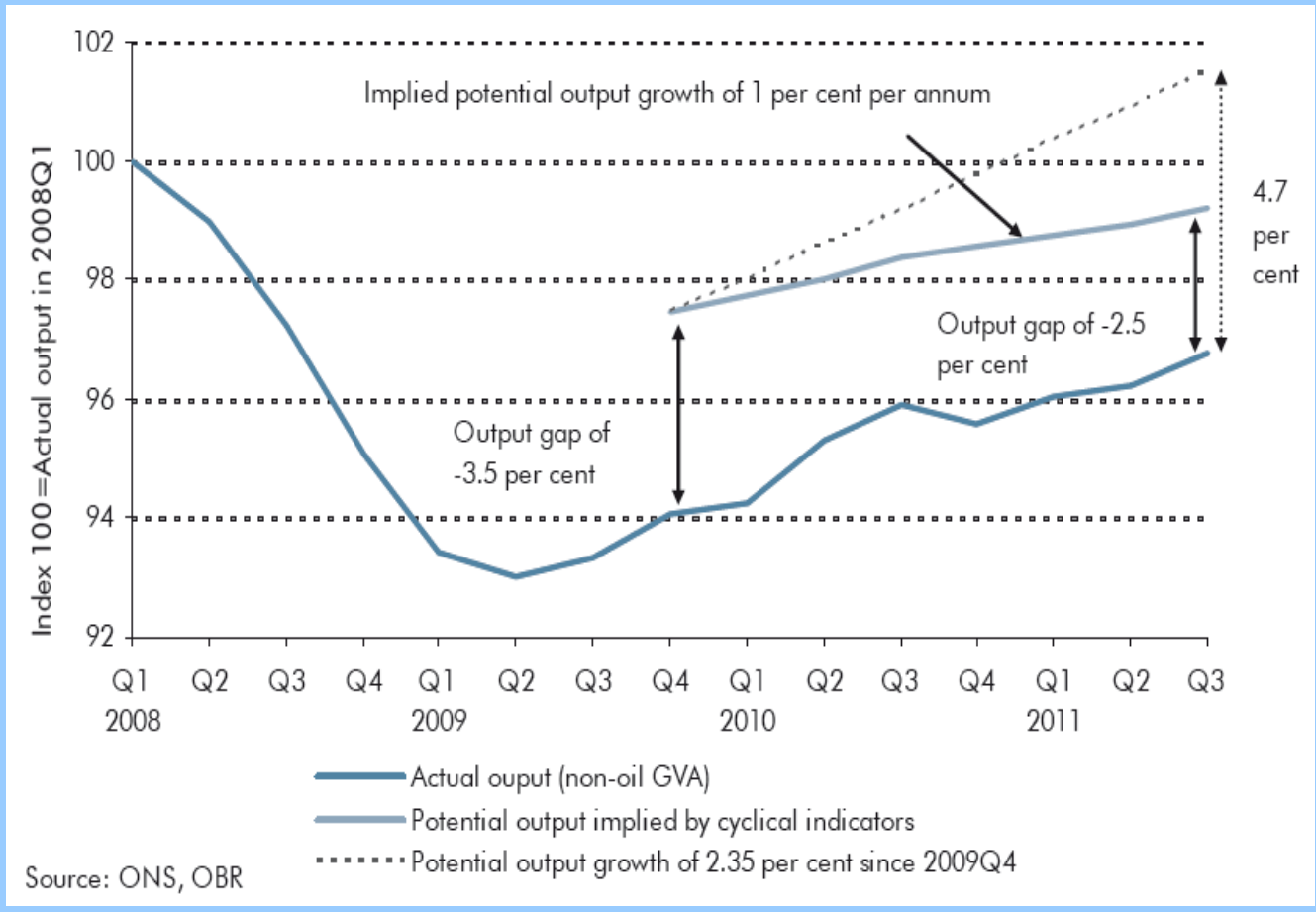
4. Recent applications

- November 2011 forecast: indicators suggested narrowing of output gap, despite weak actual growth
- Implied potential growth of 1% since end 2009
- Period coincided with weak measured productivity growth

Actual and potential output: November 2011



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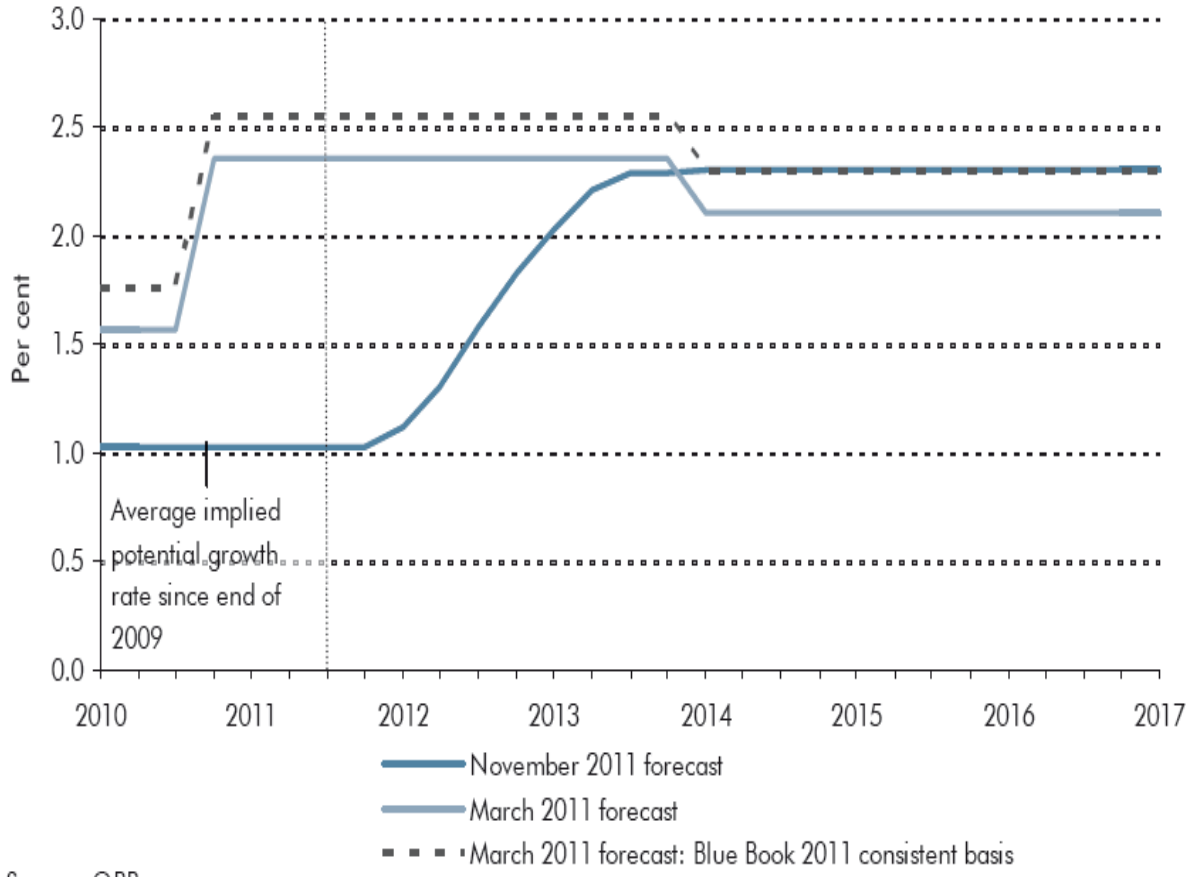
4. Recent applications

- November 2011: weaker projection for potential growth
- Narrower output gap implied lower starting level of potential output
- Resulted in downward adjustment to potential output of 3½% by start of 2016
- Similar profile for March 2012 forecast

Potential growth forecasts



Source: OBR

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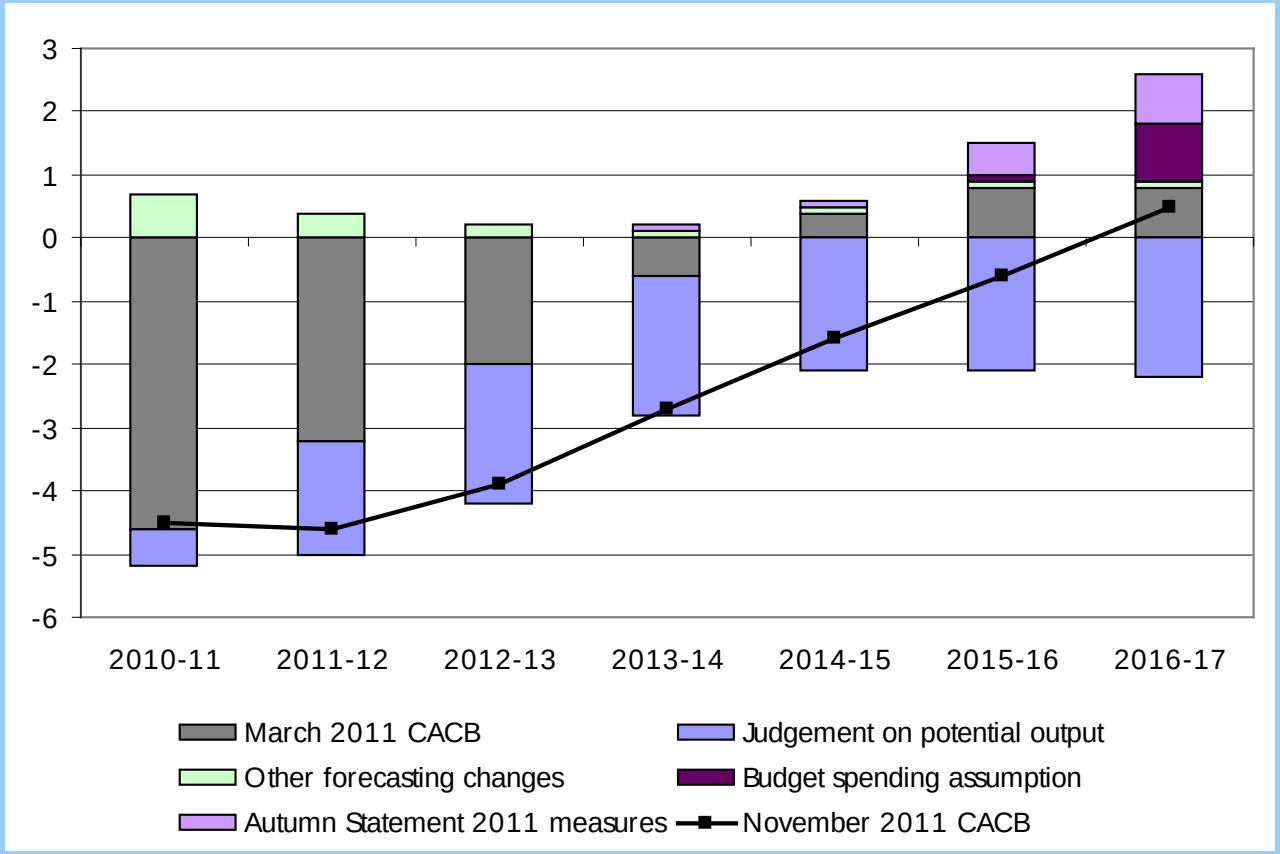
4. Recent applications

- All else equal, lower projection for potential output meant cyclically-adjusted budget balance (CACB) would have been in deficit by 2016-17
- Additional policy measures in Autumn 2011 Statement + spending assumption sufficient to push CACB into surplus by 2016-17

Changes to forecast of cyclically-adjusted budget balance (CACB): March 2011 to November 2011



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4. Recent applications

Advantages of cyclical indicator approach:

- Based on a large set of indicators of spare capacity in the economy
- Does not require a prior estimate of effect of recession on potential output components

Drawbacks:

- Survey measures may not capture all aspects of spare capacity:
  - Responses show number of firms working above/below capacity, but not necessarily how far they are above/below
  - Interpretation of “capacity” may change if there are temporary closures

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4. Recent applications

- Do not apply results of cyclical indicators approach without question
- Also consider other estimates produced by other organisations using different techniques
- Output gap estimate will always be uncertain. Two main approaches:
  - Sensitivity analysis: sensitivity of cyclically-adjusted budget balance to output gap, rate at which output gap closes and cyclical adjustment parameters
  - Alternative scenarios: examine how conclusions may change if we were to vary some of the main forecast judgements (e.g. oil price, structural unemployment, credit conditions)

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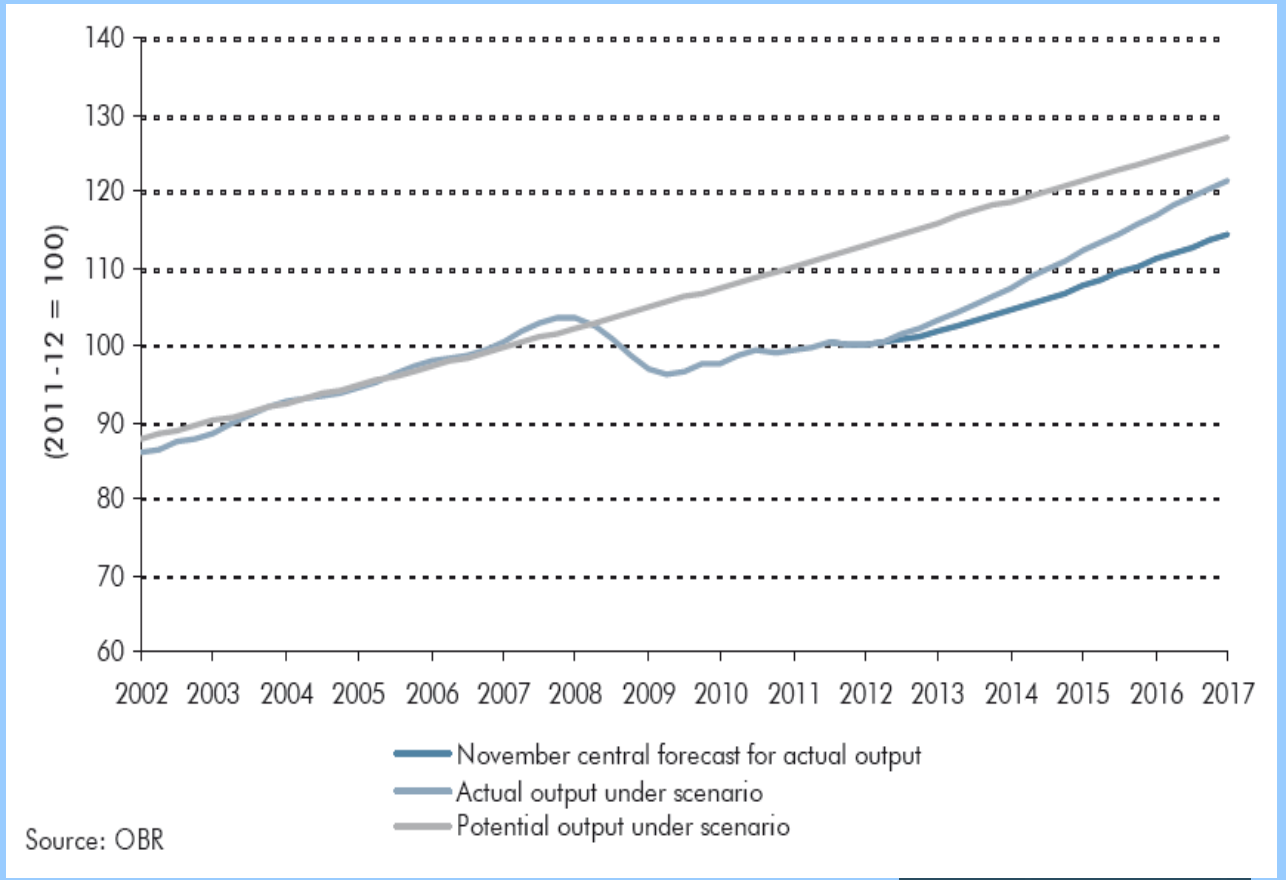
4. Recent applications

- Central forecast assumes permanently lower potential output following financial crisis
- November 2011: “no structural impairment” scenario:
  - Potential output assumed to be extrapolation of pre-crisis trend
  - No permanent effect from recession

Actual and potential output: alternative scenario-”no structural impairment



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4. Recent applications

- No structural impairment scenario:
  - Significantly higher GDP growth
  - Wider output gap
  - Cyclically-adjusted current budget already in surplus, and improves to just under +6% by 2016-17

Key economic and fiscal aggregates under alternative scenarios: November

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
November 2011 Central forecast						
GDP (per cent change)	0.6	0.9	2.4	2.8	3.1	3.0
Output gap	-2.8	-3.1	-2.8	-2.3	-1.5	-0.7
Cyclically-adjusted current budget (CACB)	-4.6	-3.9	-2.7	-1.6	-0.6	0.5
No structural impairment						
GDP (per cent change)	0.6	1.9	3.9	4.1	4.2	4.0
Output gap	-10.8	-11.3	-10.0	-8.4	-6.6	-5.0
Cyclically-adjusted current budget (CACB)	0.8	2.2	3.6	4.4	5.1	5.9

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5. Concluding remarks

- Output gap a key judgement for the economic and fiscal outlook, as well as assessment of fiscal mandate
- Any estimate of the output gap is subject to significant uncertainty, even many years after the event
- As with any approach, cyclical indicators method has advantages and drawbacks:
  - Also consider range of other available estimates based on other techniques
  - Sensitivity analysis of forecasts to output gap estimates
  - Broader economic scenarios test implications of changes in key forecast judgements

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