

Discussion of  
'Price Trends over the Product Life Cycle  
and the Optimal Inflation Target'  
by Klaus Adam and Henning Weber

Martin Seneca  
Bank of England

Monetary Policy in the New Normal  
Banca d'Italia, Rome, 11 October 2019

Views expressed are those of the presenter and should not be taken  
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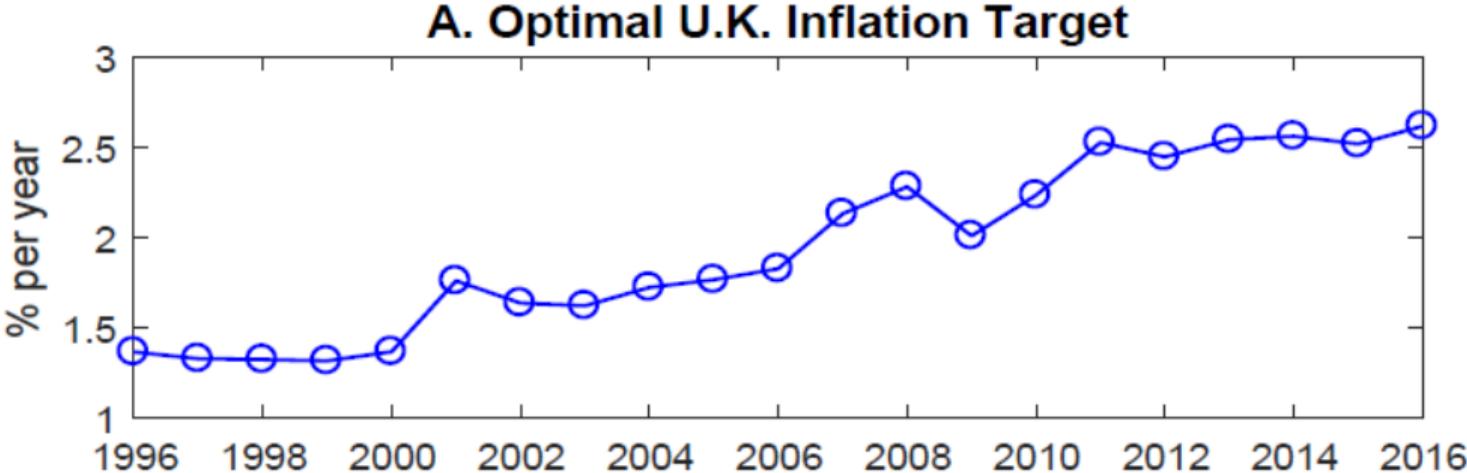
# Optimal inflation

- ▶ Consensus that extreme outcomes for inflation very costly
- ▶ Less agreement on the costs and benefits of moderate inflation
- ▶ Optimal rate of inflation determined by frictions
  - ▶ Negative with transaction frictions
  - ▶ Zero with nominal rigidities
  - ▶ Positive with downward nominal rigidity and zero lower bound
- ▶ A 2% target emerged as a pragmatic definition of price stability
- ▶ Recent experience has called the 2% target into question
- ▶ Careful analysis of the costs and benefits of inflation important

# The paper

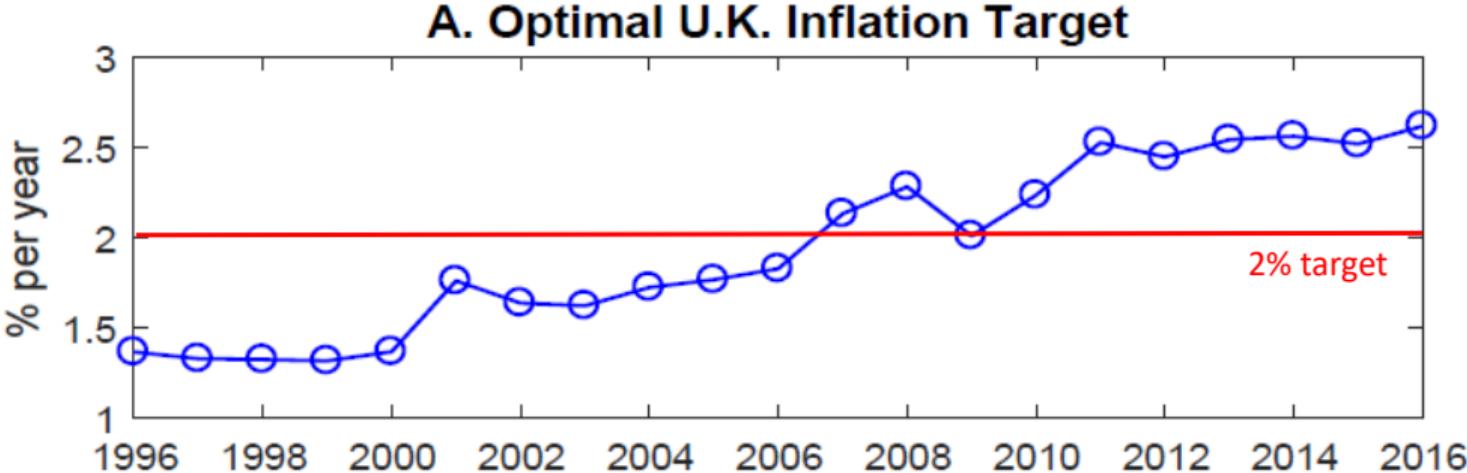
- ▶ UK micro price data
  - ▶ Relative prices of individual products fall over lifetimes
  - ▶ Heterogeneity across expenditure items
- ▶ Sticky price model with a product life cycle
  - ▶ New differentiated products have higher quality
  - ▶ Firms gain experience in manufacturing individual products
  - ▶ Heterogeneity across consumption items
- ▶ Optimal inflation target in theory
  - ▶ Quality gains favour deflation
  - ▶ Experience accumulation favours inflation
  - ▶ Heterogeneity implies non-trivial weighing across consumption items
- ▶ Estimate of optimal inflation target for the United Kingdom

# Key result



Source: Adam and Weber (2019)

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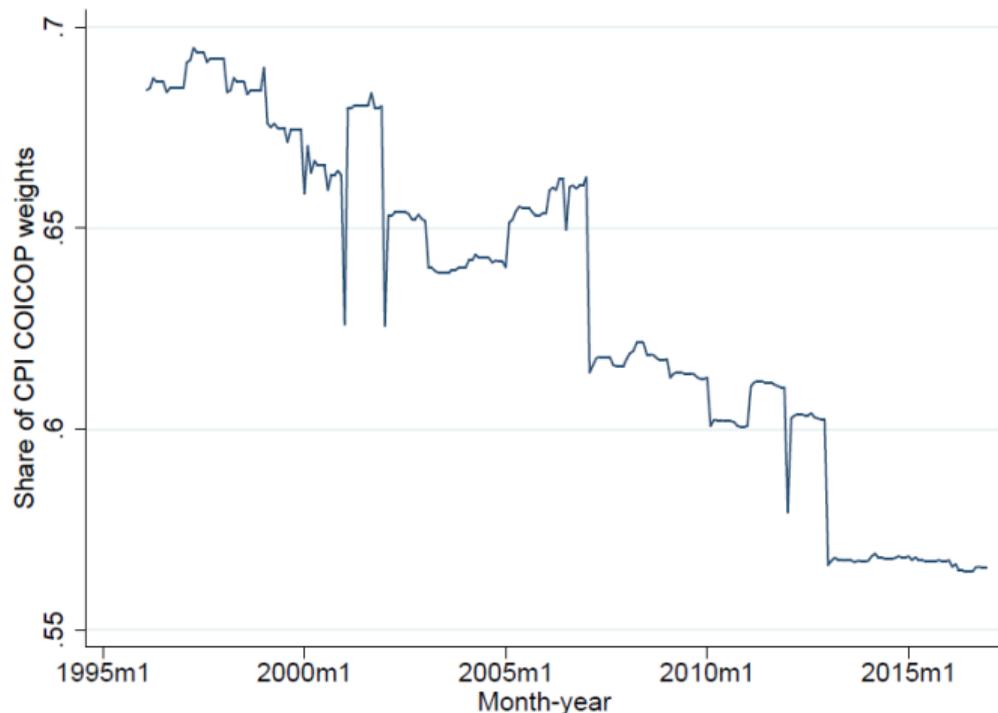
# Comments

1. The data
2. The product-life-cycle story
3. The operational target and the open economy

# 1. The data

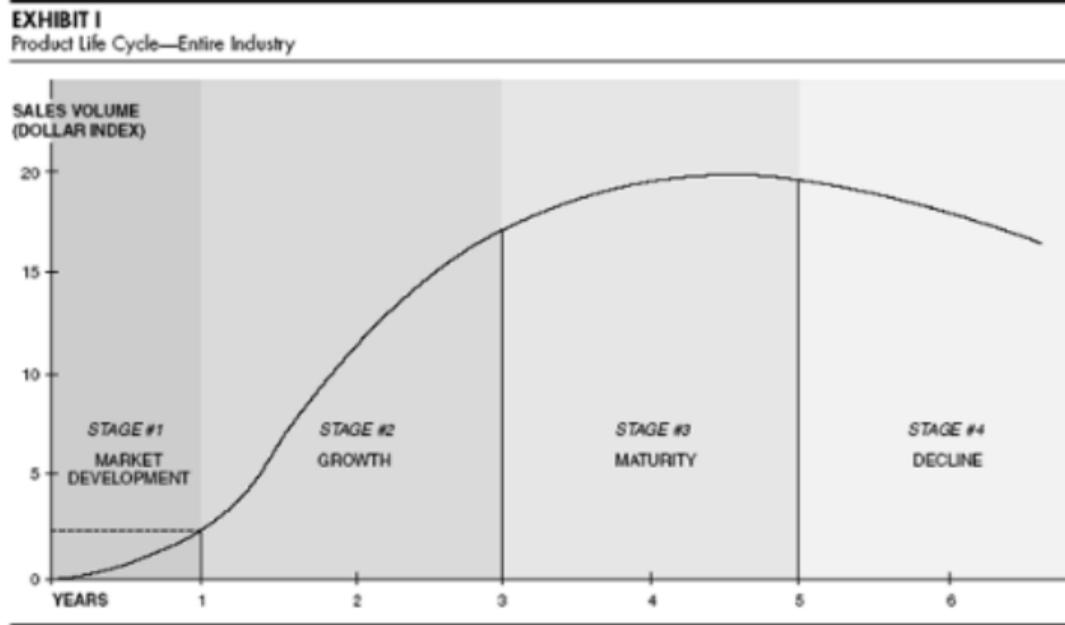
- ▶ UK micro price data publicly available
- ▶ Caveat 1: centrally collected prices excluded
  - ▶ Significant part of sample (e.g. big supermarkets)
  - ▶ Examples given are 'special cases' (e.g. 'horceracing admissions')
  - ▶ Cannot rule out that systematically different pricing behaviour
- ▶ Caveat 2: limited location information
  - ▶ Cannot generally track individual product prices
  - ▶ Location information for 'approved researchers' in ONS Safe Setting
- ▶ Three COICOP divisions stand out
  - ▶ Clothing & Footwear
  - ▶ Communications
  - ▶ Recreation & Culture

# Share of CPI in publicly available micro data



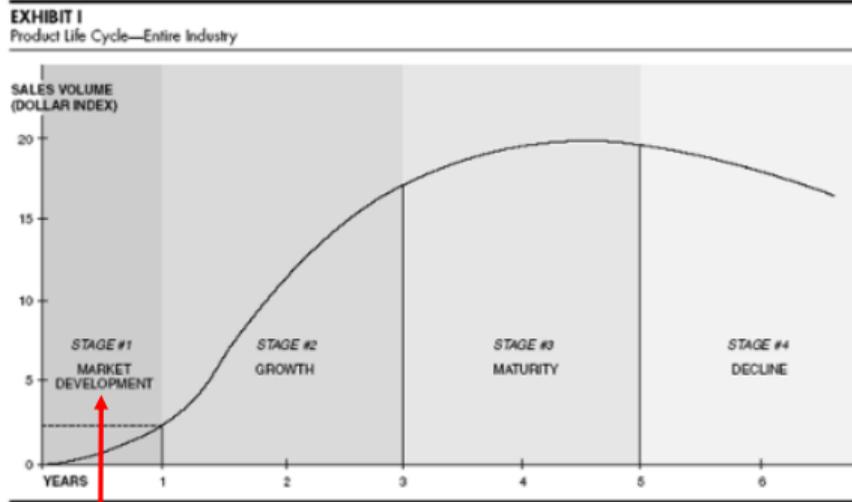
Source: Riva (2019)

## 2. The product-life-cycle story



Source: Levitt *HBR* 1965

# The PLC PLC

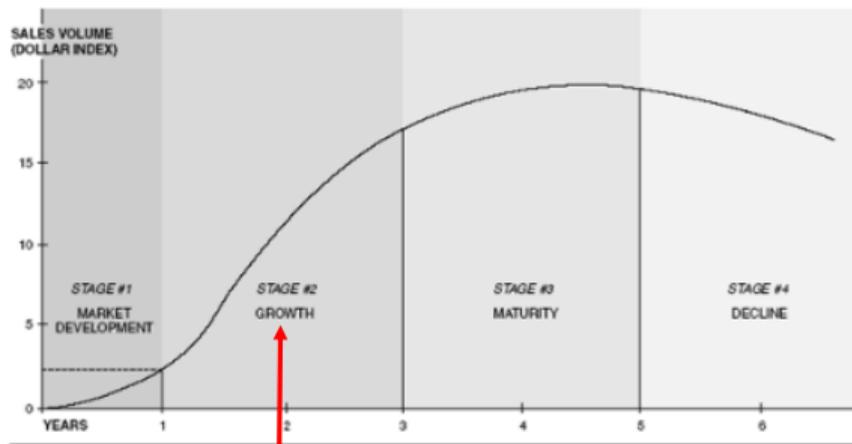


"[PLC] has remained—as have so many fascinating theories in economics, physics, and sex—a remarkably durable but almost totally unemployed and seemingly unemployable piece of professional baggage...it seems time to put it to work."

—Levitt *HBR* 1965

# The PLC PLC

**EXHIBIT I**  
Product Life Cycle—Entire Industry

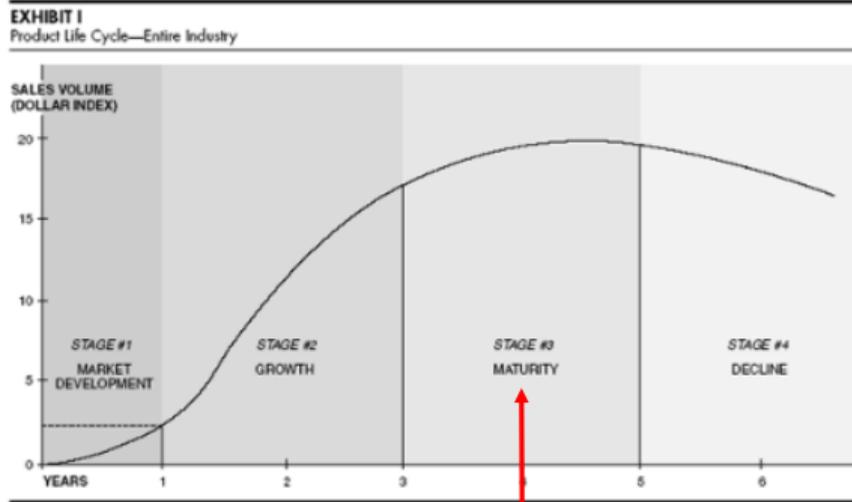


*Journal of Management*, Special Issue, Autumn 1981

*"[T]his study...provides support for [PLC's] inclusion as an important contingency factor during strategy formulation."*

— Anderson and Zeithami *AoMJ* 1984

# The PLC PLC

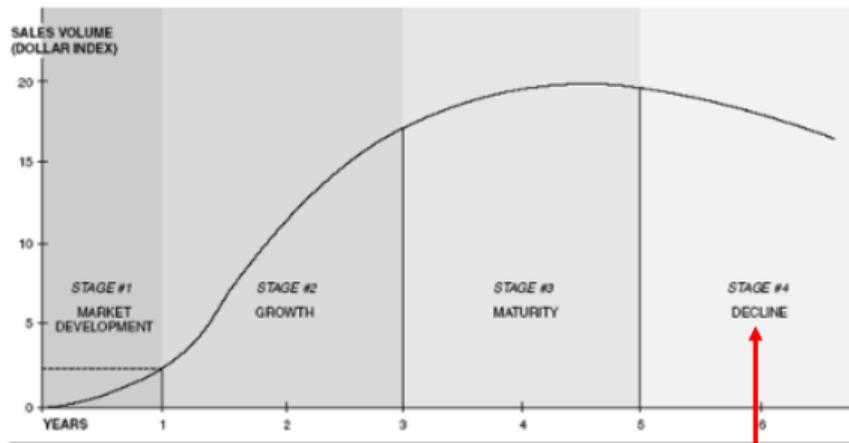


Chapter: "Developing, Differentiating, and Positioning Products Through the Life Cycle."

—Kotler (2002): Marketing Management, Millennium Edition

# The PLC PLC

**EXHIBIT I**  
Product Life Cycle—Entire Industry

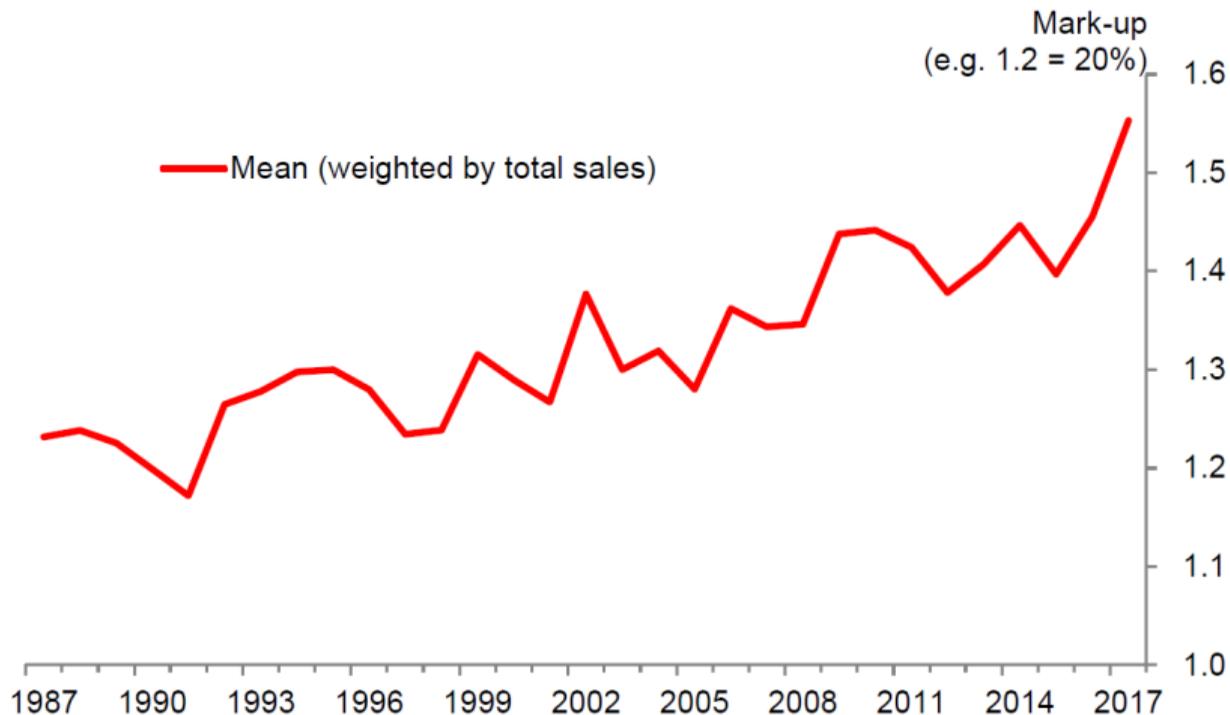


*"The academic literature seems to have all but buried the PLC concept."*  
—Steffens AoM Conference Proceedings 2002

# Market structure

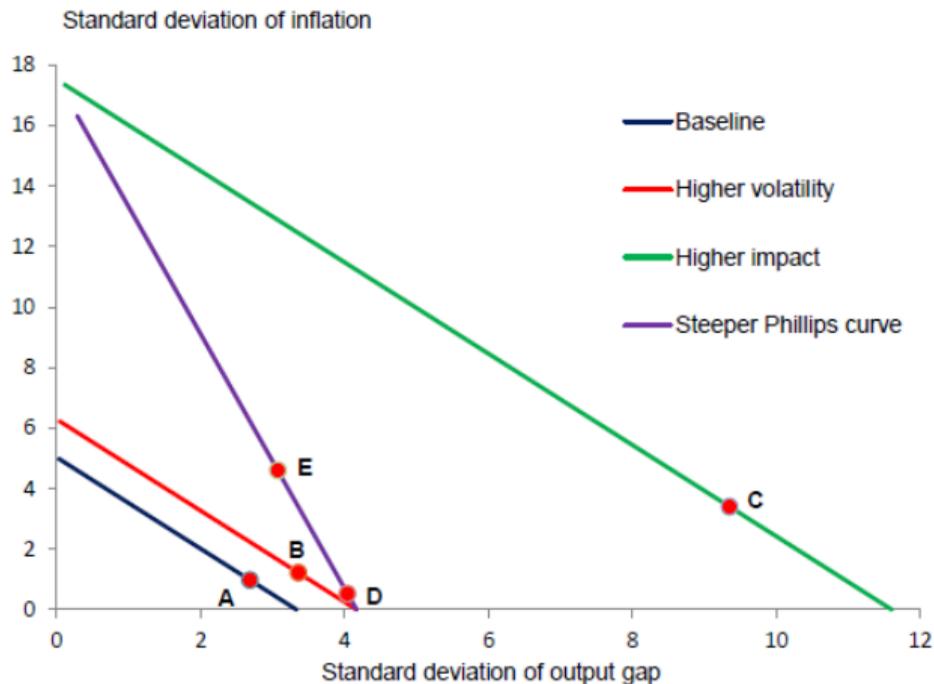
- ▶ PLC in paper is linear and entirely driven by technology
- ▶ Technology not equally important across consumption items
  - ▶ Quality improvements in new trainers probably fairly limited
  - ▶ Mobile phone accessories probably fairly easy to produce
  - ▶ Le Mis certainly does not become less miserable over time
- ▶ For 'news value' items it may be a mark-up story instead
  - ▶ Market development to build and extend market power
  - ▶ Price elasticity increases as news value wears off
- ▶ Macro still catching up with Industrial Organisation
  - ▶ Monopolistic competition and Calvo price setting in macro
  - ▶ Structure-conduct-performance long abandoned in IO

# UK listed firms' average mark-ups



Source: Haldane et al. (2018)

# Impact of mark-ups on inflation and output gap volatility



Source: Haldane et al. (2018)

# An alternative product life cycle

- ▶ Generalised Kimball *JMCB* 1995 aggregator

$$\int_0^1 \mathcal{G}_{j,t} [Y_t(j) / Y_t] dj = 1$$

with  $\mathcal{G}_{j,t}(1) = 1$ ,  $\mathcal{G}'_{j,t} > 0$  and  $\mathcal{G}''_{j,t} < 0$  for all  $t$  and  $j \in [0, 1]$

- ▶ Results in time-varying, product-specific price elasticity of demand

$$\varepsilon [Y_t(j) / Y_t] = - \frac{\mathcal{G}'_{j,t} [Y_t(j) / Y_t] Y_t}{\mathcal{G}''_{j,t} [Y_t(j) / Y_t] Y_t(j)}$$

- ▶ Combine declining elasticity over lifetime with deep habit formation

### 3. The operational target and the open economy

- ▶ Theory of optimal rate of CPI inflation in closed economy
  - ▶ CPI inflation minimising relative-price and mark-up distortions in steady state
  - ▶ No discussion of Ramsey optimal policy
- ▶ What is the Woodford (2010) optimal price index?
  - ▶ Remains constant in the long run under optimal monetary policy with timeless commitment even in the case of permanent shocks to relative prices
- ▶ PPI inflation targeting generally superior to CPI inflation targeting
- ▶ Weighting scheme may be very different in a small open economy
  - ▶ Production rather than consumption weights
  - ▶ International relative price distortions
  - ▶ Market structure may be more important
- ▶ The United Kingdom is a small open economy in this context

# Conclusion

- ▶ Significant contribution to important work to better understand the costs and benefits of moderate inflation
- ▶ Great paper in its own right
  - ▶ Insightful new use of micro data for macro question
  - ▶ Careful data work and serious macroeconomic modelling
  - ▶ Admirably clearly written
- ▶ Support for moderately positive inflation target around two per cent – but does not as it stands provide argument for raising it
- ▶ Summary of comments
  1. Data limitations may be underplayed
  2. Alternative stories seem important for key sectors
  3. Open economy linkages likely matter for quantification