Industry Productivity Growth Cycles

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Derek Burnell

Outline

The Problem

Solution and Methods

Estimation and Results

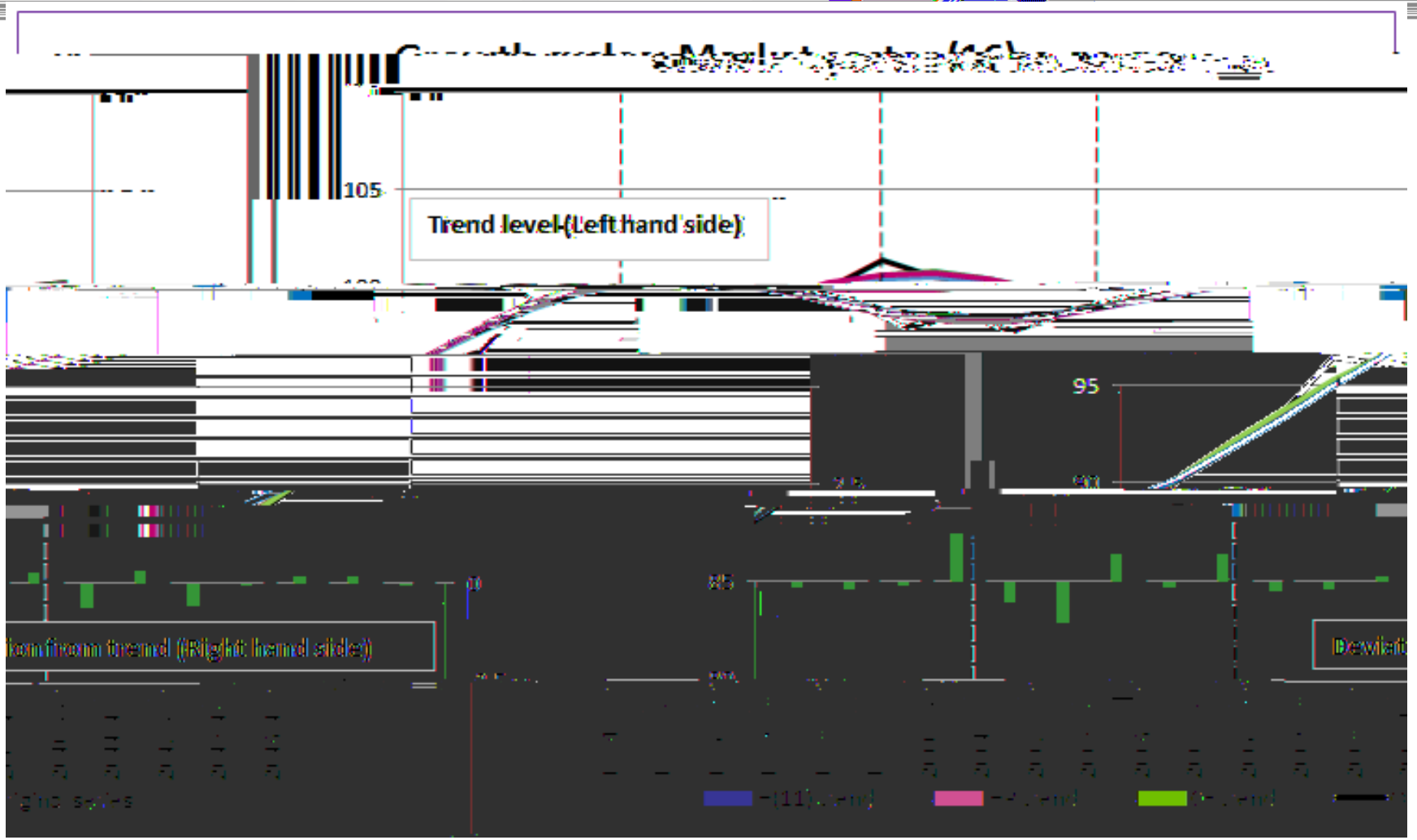
Points for Discussion

The problem

Solution 1: growth cycles

Taking into account these factors (no reliable utilisation

Aggregate growth cycles



Dampening utilisation distortion

- Usually, capacity utilisation is high during times of strong economic growth, but inputs become underutilised as economic activity declines.
- By matching years when capacity utilisation is at its highest, growth cycles compare productivity growth when economic activity is at a maximum (i.e., at the peaks).
- The peaks provide the basis for more consistent comparisons by netting out variations between the peaks.

Solution 2: Growth accounts

Productivity growth accounting framework improves interpretability by:

Weighting contributions by their income share

Showing the key “drivers” of output growth (contributions to growth are additive)

Reducing distortions in MFP

More granular growth accounts

Extended the growth accounts:

- KLEMS growth accounts for 16 industries in datacubes 5260.055.003 & .004
- Contributions to Market sector labour productivity from Capital Deepening and MFP in 5260.055.002
- Contributions to Mining GVA from mineral & energy inputs, capital, labour & MFP in .002

Increased granularity (volatility !)

Determine growth cycle peaks

For aggregates, Henderson 11 term symmetrical filter

For industries, three filters:

Henderson (11) cubic weighted least squares with weights chosen to minimise the sum of squares of their 3rd differences (the smoothing criterion). Symmetrical with surrogates at endpoints

Hodrick-Prescott (1997) a high pass filter used to separate the series into trend and cyclical components through the solution of the constrained minimisation problem

Christiano and Fitzgerald (2003) a finite length linear band-pass filter that that minimises the mean squared error between the original and filtered series

Defining the peaks…

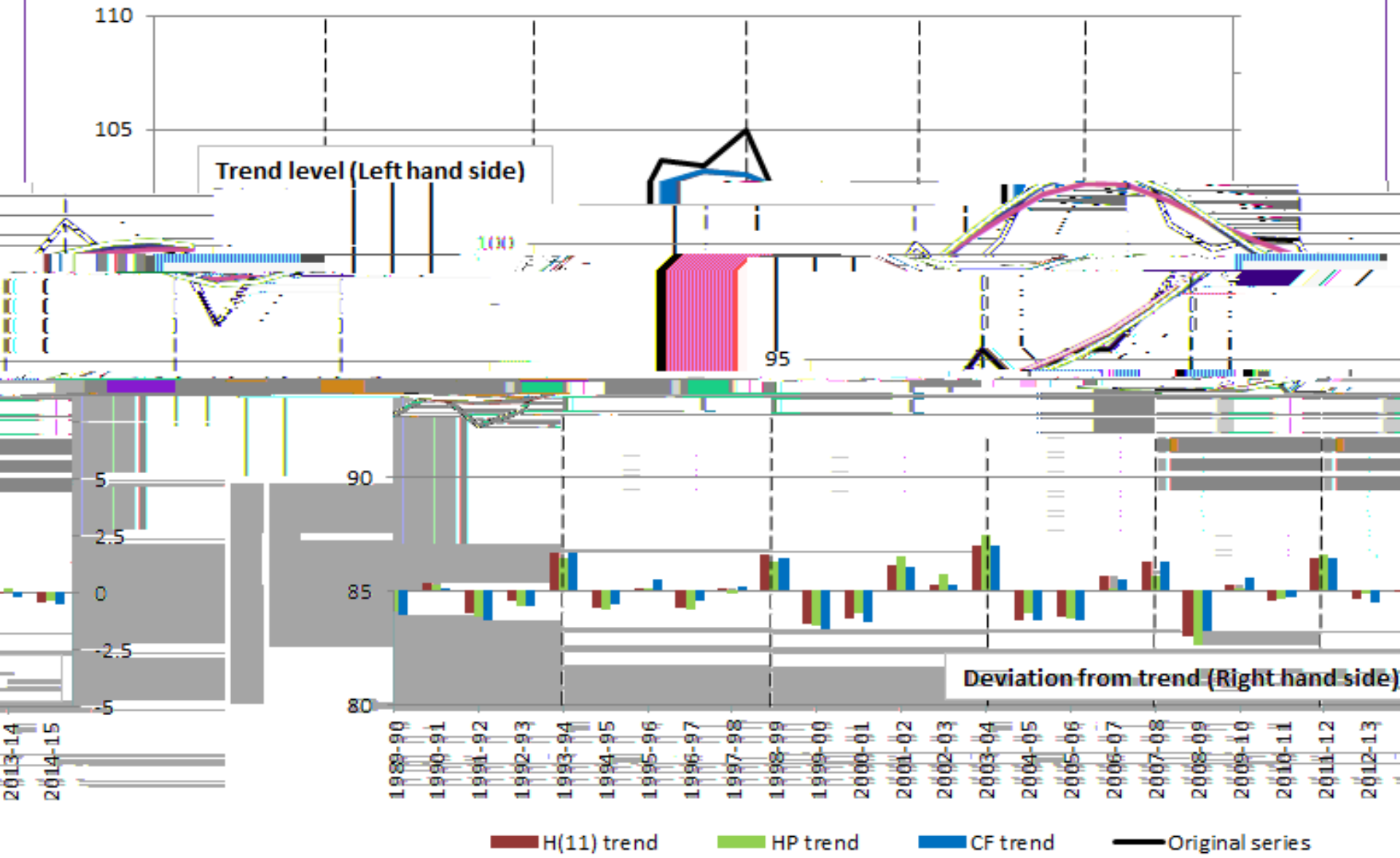
A peak is considered to be “robust” if it is identified by the three filters and:

Shows positive deviations ≥ 1%, peaks four or more years apart (95% of cycles met this rule)

Deviations < 1% next to a neighbouring trough, four or more years apart (5% of cycles met this rule)

Some peaks were discarded (too close together)

Growth cycles: Manufacturing



Key Findings

Only two industries had cycles aligning with aggregate cycles (2 cycles in Manufacturing & 2 cycles in Info, media & telco)

2 to 5 cycles per industry (Half (8) of the industries have 4 cycles

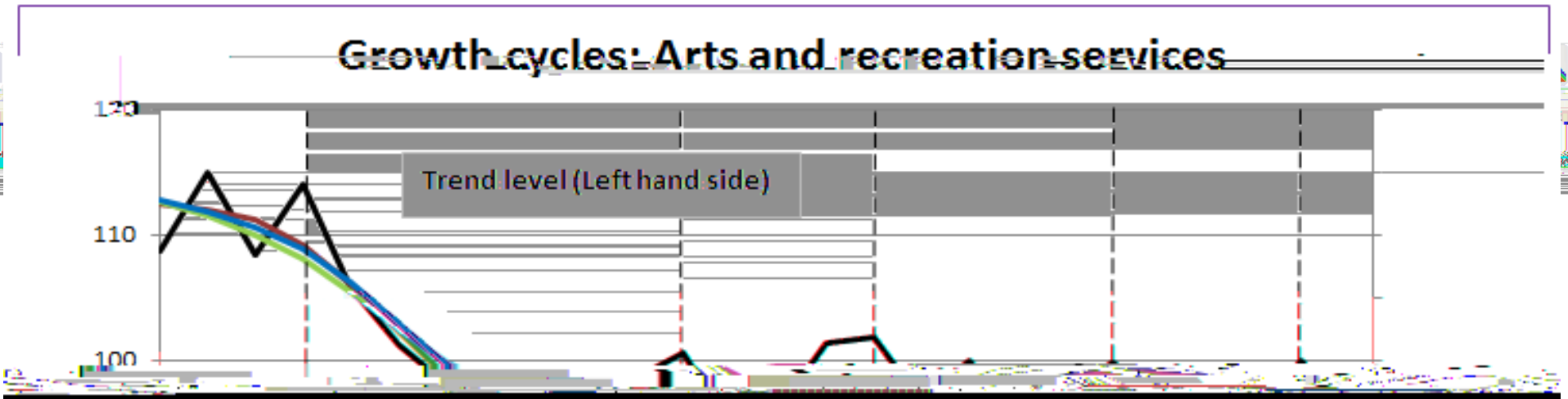
Longest cycle: Professional, scientific (12 years)

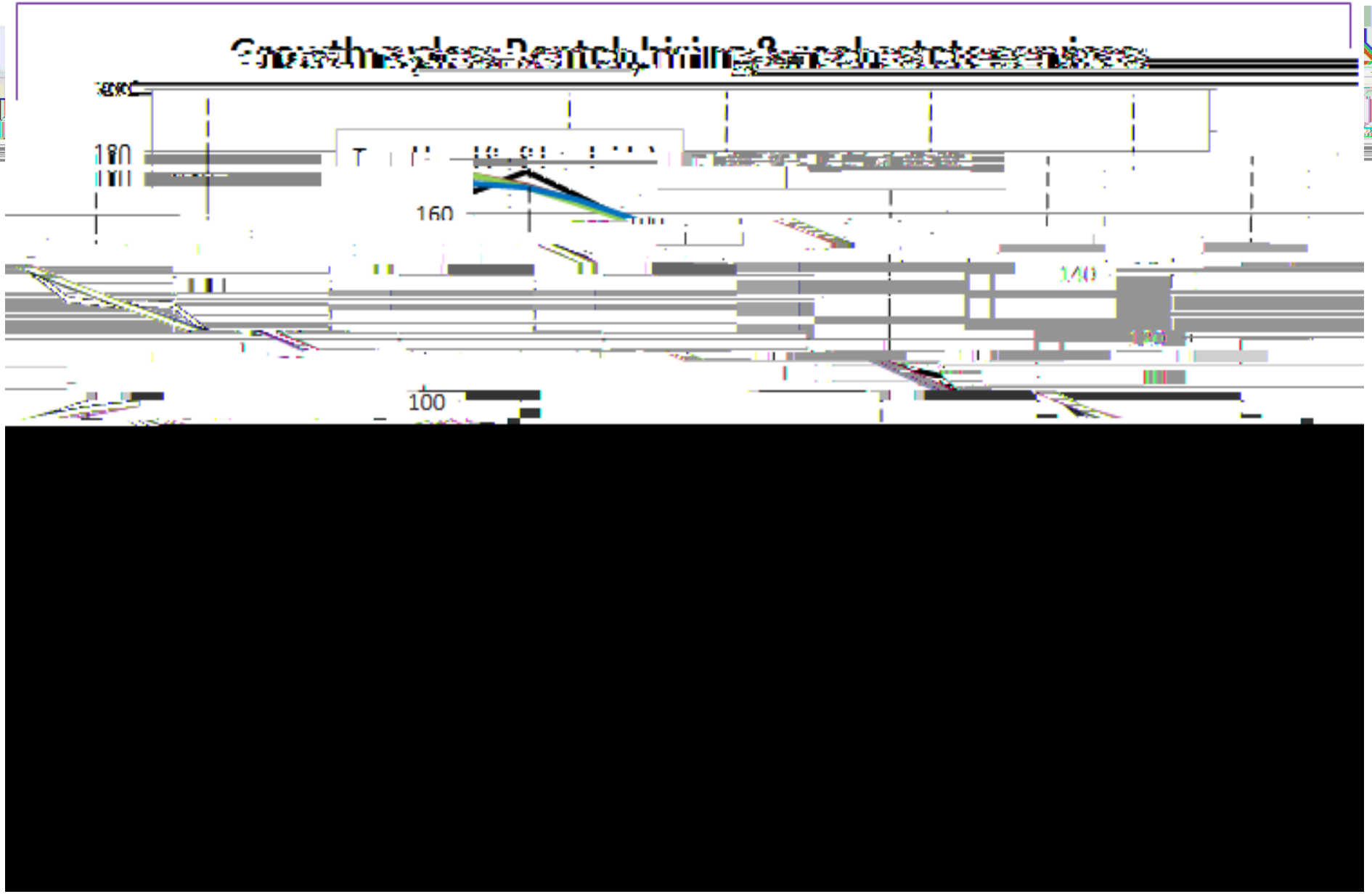
Shortest cycle: 4 Years (common place)

Considerable variation in industry cycles, confirms Barnes (PC, 2011). Caution using standardised averaging !

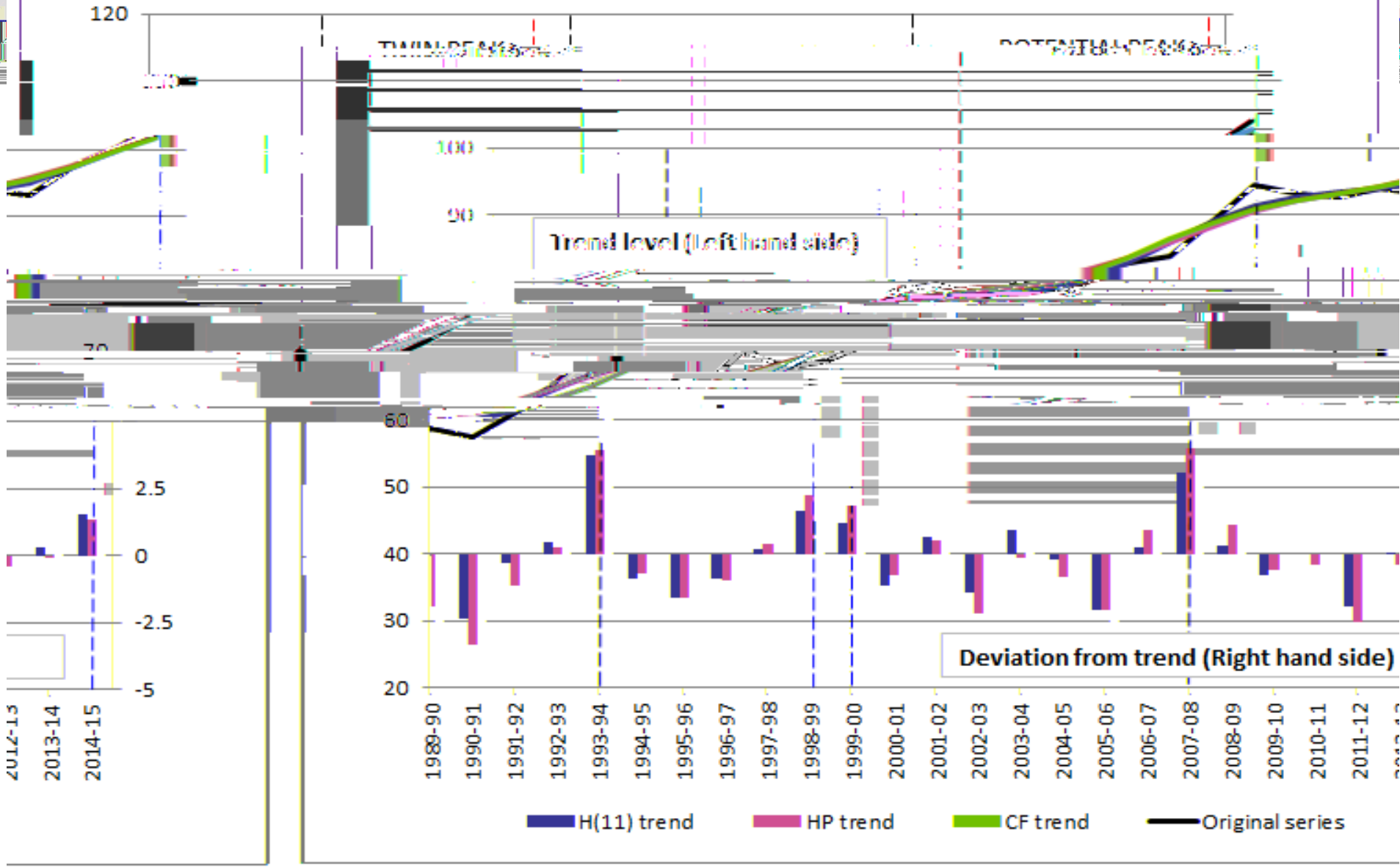

AGRICULTURE
EGWWS
MINING
ARTS & REC
RETAIL
TRANSPORT, POSTAL
WHOLESALE
FINANCE & INSUR
OTHER SERVICES

Underlying trend criteria?


Growth cycles: Arts and recreation services
120
110
100
Trend level (Left hand side)

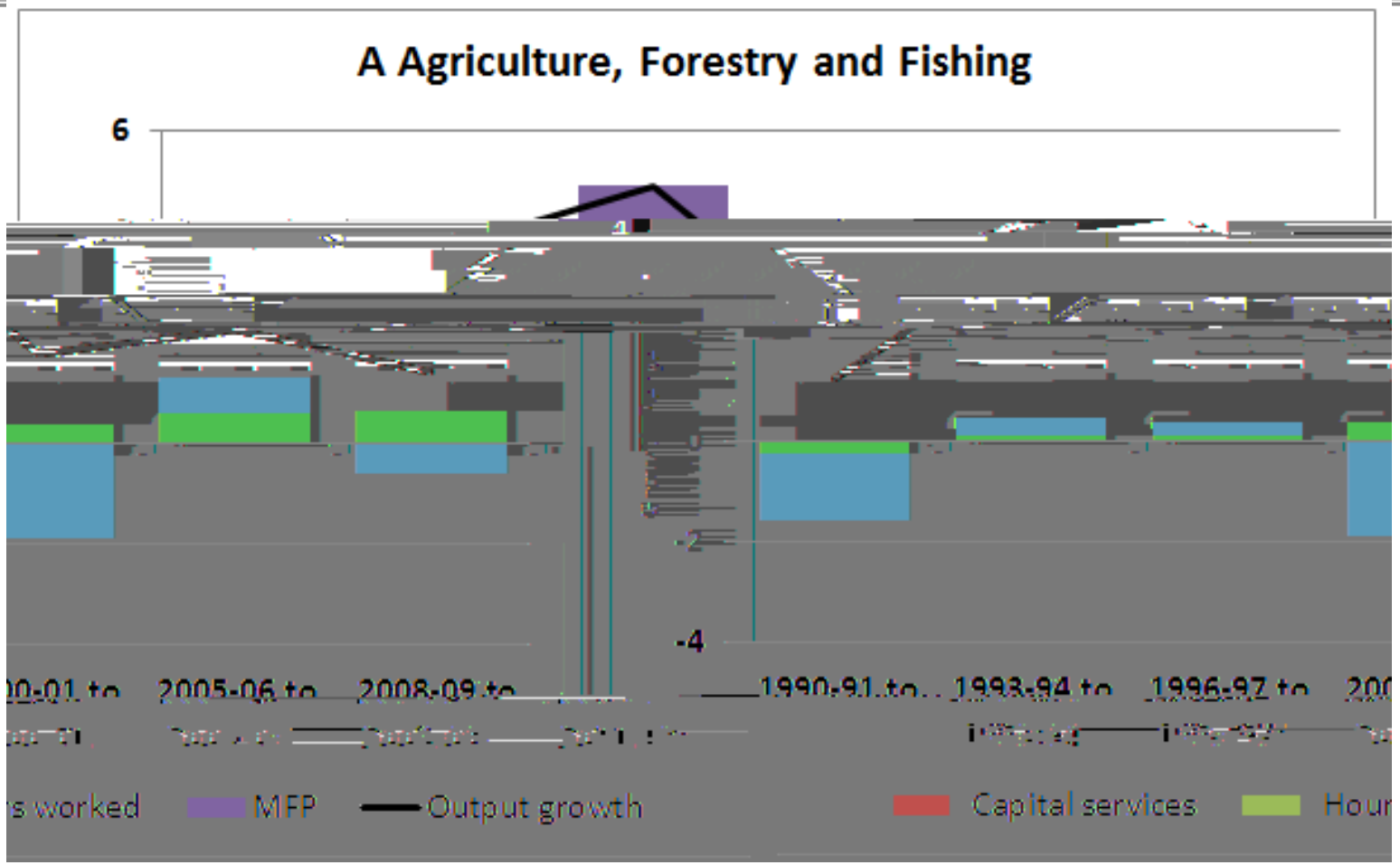

180
160
140
120
100

Growth cycles: Finance & insurance services

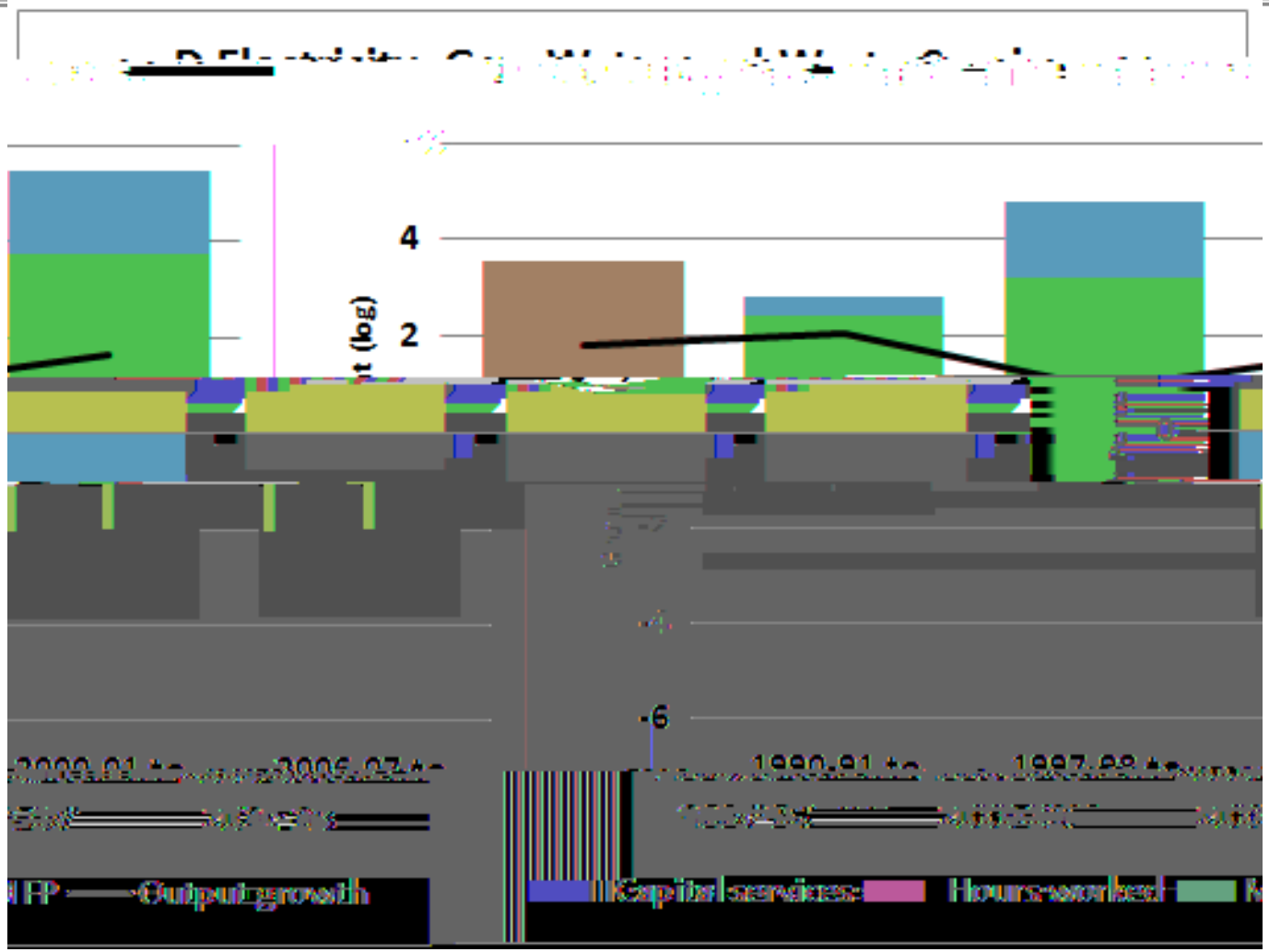


Growth Cycle Results

Growth Cycle Results . . .



Growth Cycle Results . . .



Conclusions

Overall, the industry growth cycle results show that

Growth cycles vary considerably at the industry level, helping to reveal the diversity across industries

Growth accounts for growth cycles are a useful tool for analysing drivers of growth with (potentially) less distortion from utilisation

Supports the industry policy analyst in uncovering ‘real world’ industry growth patterns

Care needs to be taken when applying a standardised averaging method across all industries (like 5 year averages).