

# Economies of Scale and Scope in Australian Universities:

## Implications for Structural Reform, Institutional Specialization, and Cross-Institutional Collaboration

### Introduction

#### Major gaps

- Out-of-date data
  - Most previous studies still use the dataset before 2006
- The discussion of output is not complete
  - Another possible form of instruction output, distance education, is obviously ignored by previous studies
- No study offers further strategies for universities to achieve scale and scope economies

This project uses a multiplicatively separable cost function for a sample of 37 Australian public universities over the period 2003-12 to investigate the following topics:

- Current cost economies (economies of scale and scope) in the Australian university sector
- Implications from the estimates of cost economies
- Further strategies to achieve economies of scale and scope

### Methodology

#### Econometric Model

$$C'_{ht} = C(y, w) + \varepsilon_{ht}$$

$$= \left( \beta_0 + \sum_{i=1}^7 \beta_i y_{iht} + 0.5 \sum_{i=1}^7 \beta_{ii} (y_{iht})^2 + \sum_{i,j=1; i \neq j}^{21} \beta_{ij} y_{iht} y_{jht} + \sum_{p=1}^{3-1} \beta_p w'_{pht} \right) + \varepsilon_{ht}$$

Impose Linear homogeneity in prices ( $w_3$ ) as a numeraire price and will be omitted

Total cost and other factor prices are divided by numeraire price.

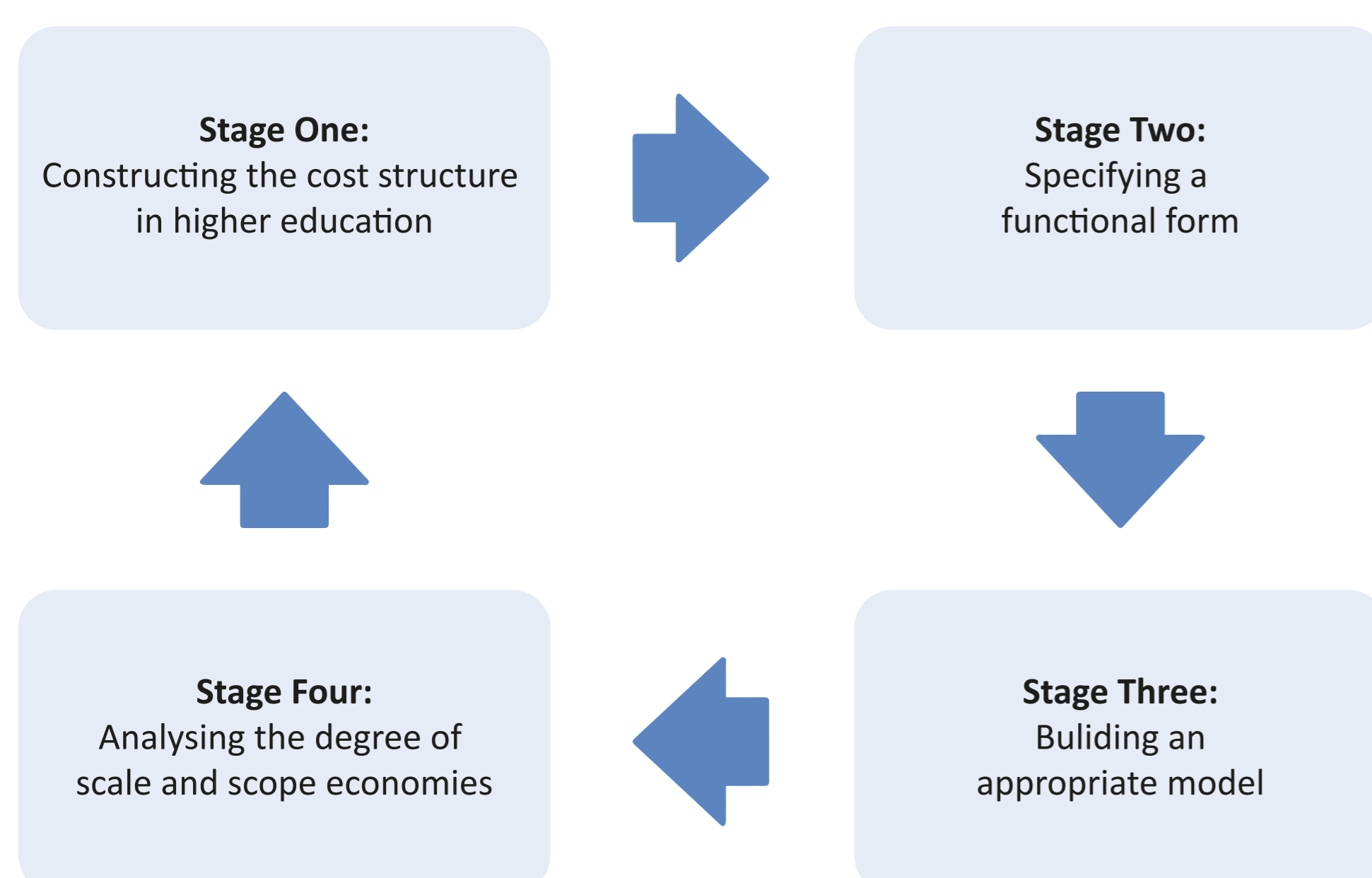
7 Outputs ( $y_i$ )

- $y_1$  undergraduate internal completions
- $y_2$  postgraduate internal completions by coursework
- $y_3$  postgraduate internal completions by research
- $y_4$  undergraduate external completions
- $y_5$  postgraduate external completions by coursework
- $y_6$  postgraduate external completions by research
- $y_7$  research grants

Total costs (C)

- 3 Prices ( $w_p$ )
- $w_1$  Academy salary
- $w_2$  Non-academic salary
- $w_3$  Physical capital

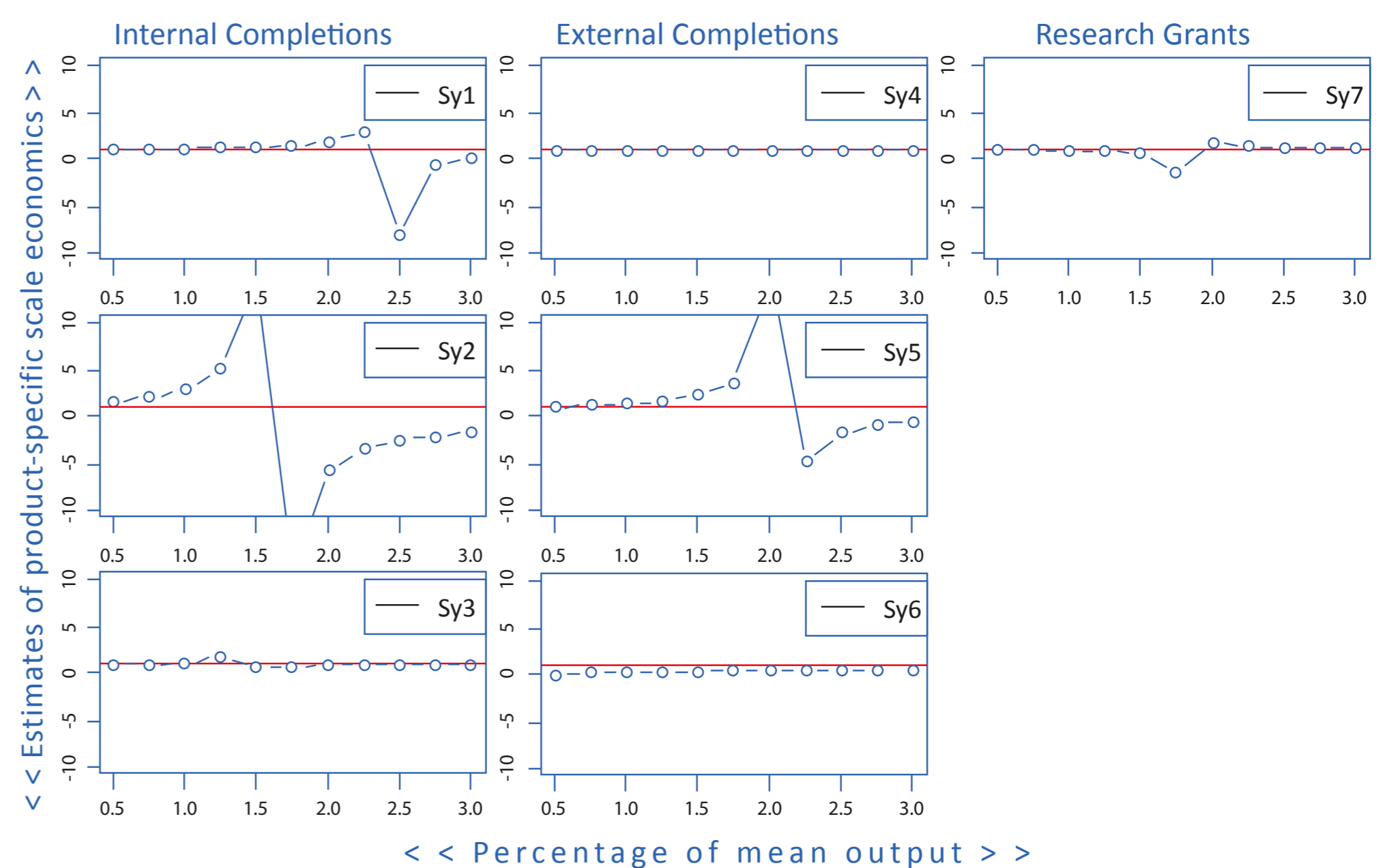
### Project Procedure



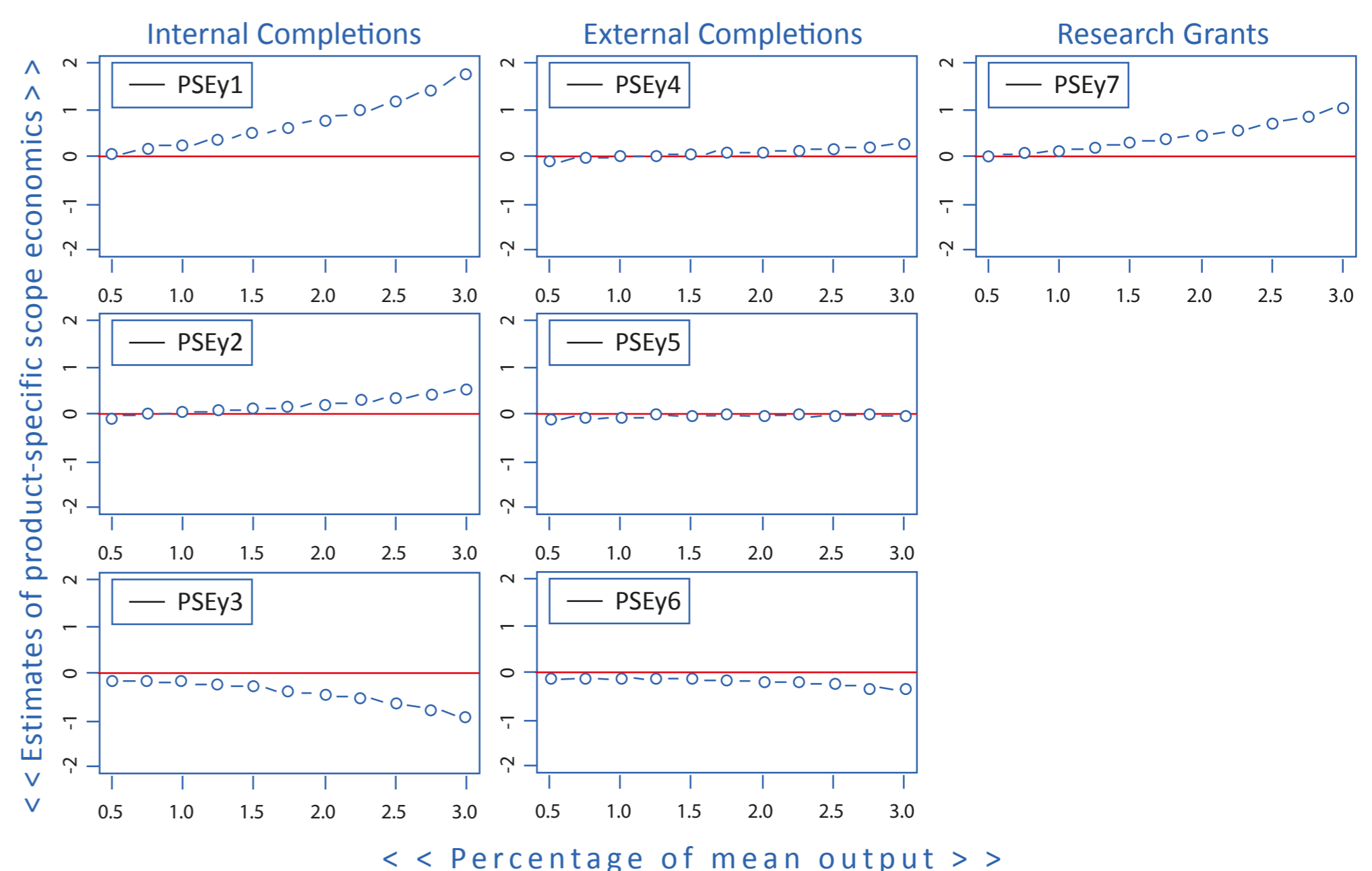
### Preliminary Results

(dots above red line imply the existence of cost economies)

#### Estimates of product-specific scale economies (Syi)



#### Estimates of product-specific scope economies (PSEyi)



### Implications so far

#### Economies of Scale (estimate > 1)

- Further structural changes are unavoidable
- Big jump could imply:
  - variances among universities
  - less accurate due to few universities with this scale

#### Economies of Scope (estimate > 0)

Scope economies are exhausted for these three types of output ( $y_3$ ,  $y_5$ ,  $y_6$ ). This means that some universities, the cost of producing these outputs with other outputs are more expensive