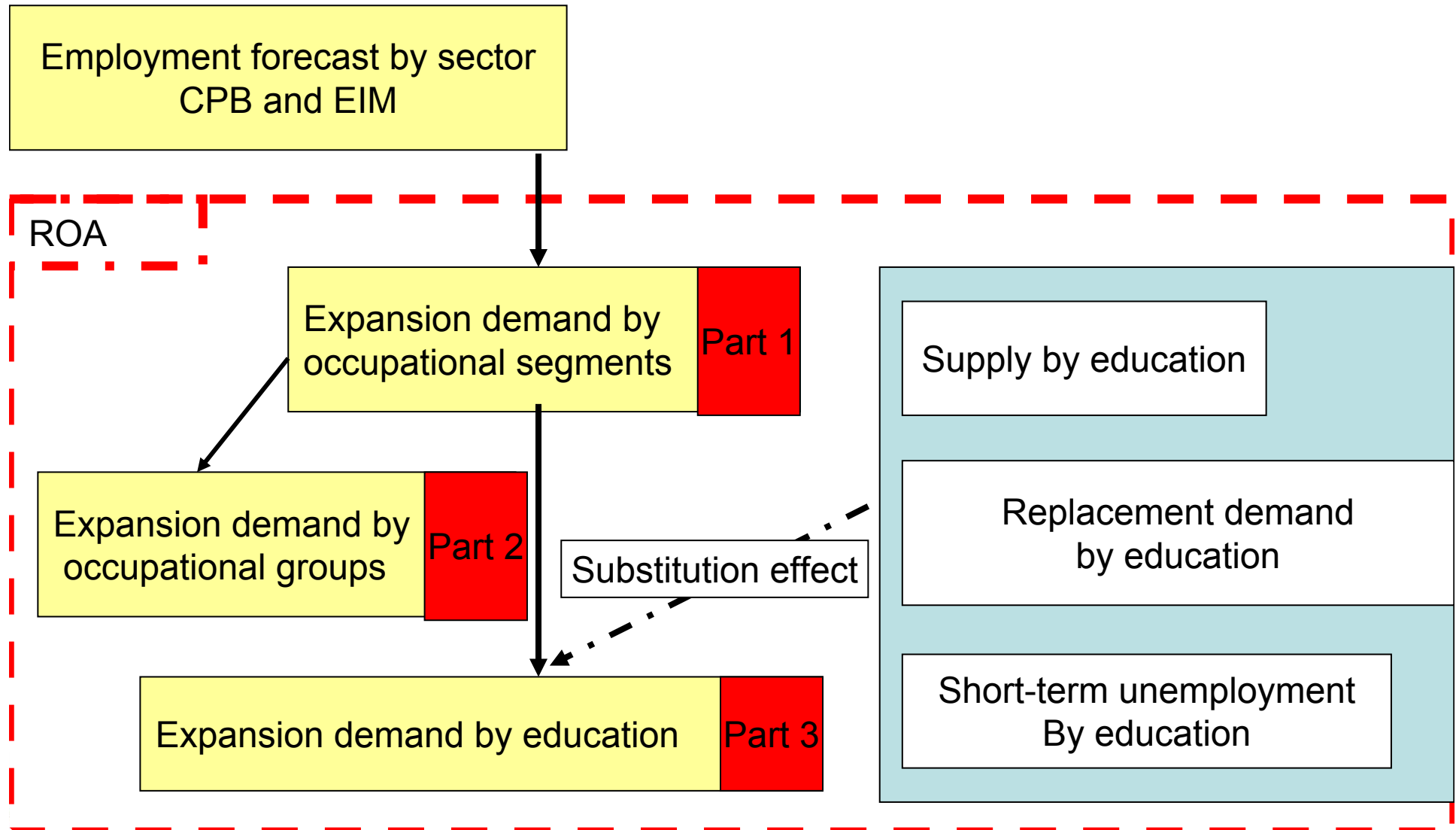


Expansion demand

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Structure of expansion demand model



Part 1: Expansion demand by occupational segments

1. Long run
2. Short run
3. Data input



The long run part of the model

1. We assume a log-linear implicit production function for the
 Log employment by sector and occupation At t
 Explanatory variables
 Capital, R&D
 Value-added
 the intermediate outputs at

$$l_{ijt} = \alpha_{ij} + \beta_t + \underline{x}'_{it} (\underline{\delta}_i + \underline{\delta}_j) + \varepsilon_{ijt} \quad (5)$$

in sector j and labor inputs differentiated by occupational segment. (if there are 5 occupations in sector j –with more than 1 000 workers – then there are 5 different labor inputs in sector

Sector occupation
Fixed effect

Year
Fixed effect

Sector-specific elasticity
Occupation specific elasticity

sector as a function of the capital stock, the stock of R&D and the intermediate output level in the respective sector (and wages => but no time-series of wages by occupation and wage sum by sector highly correlated with value added => no improvement to the model)



The short run part of the model

1.

Long run (production function implicit demand for labour)
 using cointegration techniques.

2.

Since we believe that in the short run the “contagion” of

$$l_{ijt} = a_{ij} + g_{ij} + \underbrace{d'_i h_j + d'_i h_i}_{\text{intra-sector/occupation dynamics}} + b_t + \underline{x}'_{it} (\underline{h}_i + \underline{h}_j) \quad (10)$$

$$+ \underbrace{\Delta \underline{x}'_{it} (\underline{c}_i + \underline{c}_j + \underline{e}_i^{i'} (\underline{h}_i + \underline{h}_j))}_{\text{inter-sector/occupation dynamics}} + \underbrace{\left(\sum_{s \neq i} \Delta \underline{x}'_{st} \underline{e}_s^i \right)' (\underline{h}_i + \underline{h}_j)}_{\text{inter-sector/occupation dynamics}} + \nu_{ijt}$$

we model explicitly the inter sector-occupational segment short term dependence.

Short run
intra-sector/occupation dynamics

sector d
explains in
nt) (see

Short run
inter-sector/occupation dynamics

Data input

1. Estimation:

- 1. Employment by sector and occupational segment 1988-current from Labour Force Survey.**
- 2. Investments in capital and R&D and value added 1970s-current from CBS .**

2. Macroeconomic and sector forecasting:

- 1. CPB Netherlands Bureau for Economic Policy and EIM (investments in capital, employment by sector and value added).**
- 2. R&D own calculation using exponential smoothing methods.**

Part 2: Expansion demand by occupational groups

1. **Swamy's random coefficient model**
2. **Data input**



Swamy's random coefficient model

1. First we aggregate forecast

Expansion demand by g(roup)

Expansion demand by segment g belongs to

Past "distance" between ED of g compared to ED of the segment g belongs to

2. Then, we use (swamy's) random coefficient model to "translate" forecast of expansion

$$\Delta l_t^g = \Delta l_t^j + \beta_0^g + \beta_1^g (\Delta l_{t-1}^g - \Delta l_{t-1}^j) + \varepsilon_t$$

A random effect for g(roup)

A random elasticity for g(roup)

Data inputs

1. Estimation and forecasting:

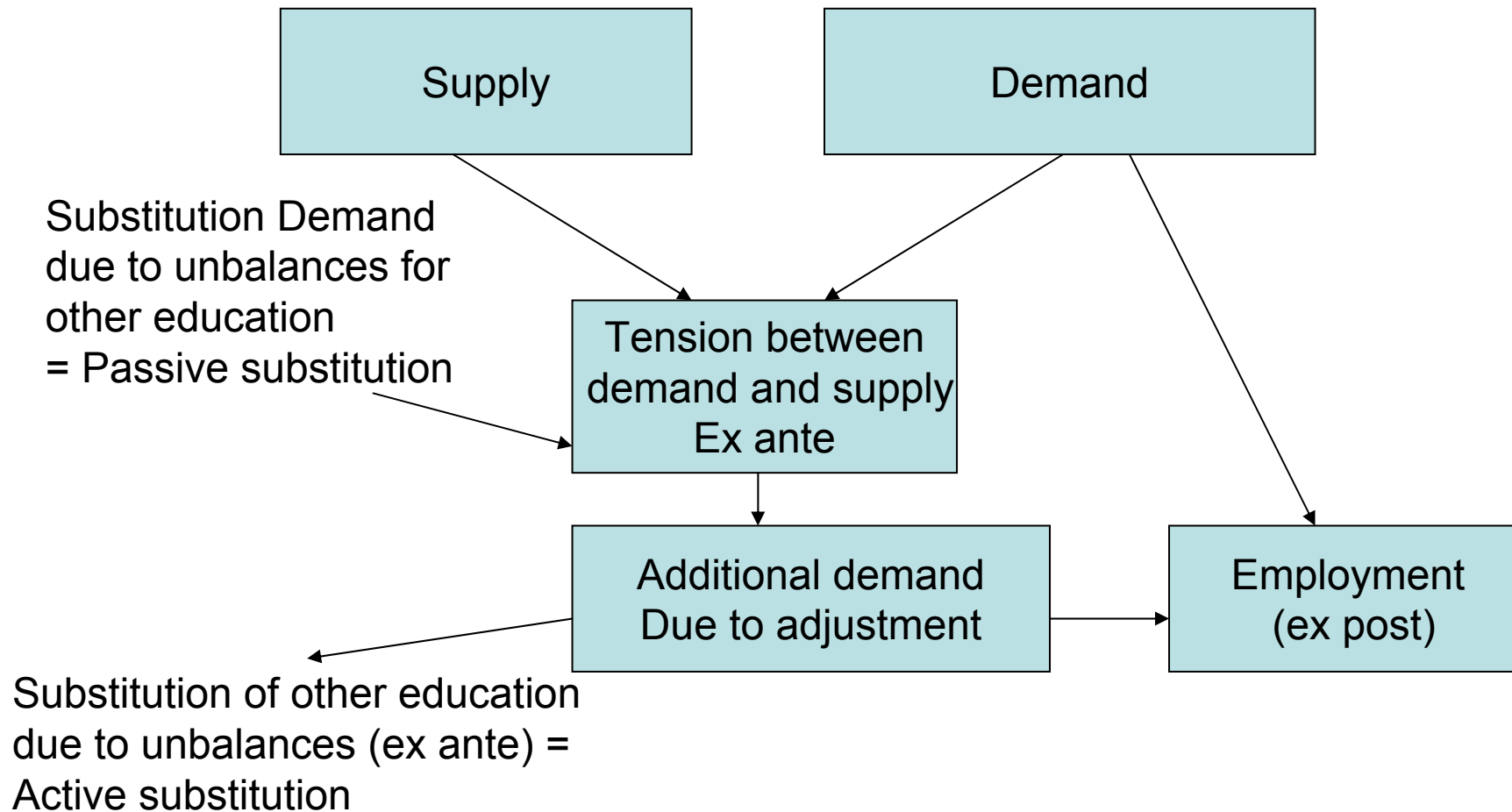
1. Labour Force survey, employment by occupational groups.

Part 3: Expansion demand by education

1. **Structure**
2. **Sub-models**
3. **Data input**



Educational model: the structure



Different sub-models

1. **Expansion demand by occupational segments is “translated” into expansion demand by education using the allocation matrix of employment by occupation and education - This already is an improvement compared to mainstream manpower forecasting-.**
2. **Model of the educational structure within occupations, allowing for SBTC. (speed of skill upgrading).**
3. **Replacement demand model.**
4. **For the medium term the inflow of graduates on the labour market is more or less known.**
5. **Confrontation between labour supply and demand allowing for (passive) substitution. => Iterative process to reach equilibrium.**

Data input

- 1. Translating forecast by occupational segment into forecast by education: Matrix of employment by education and occupational segment in current year from Labour Force Survey.**
- 2. Estimating Speed of skill upgrading: Matrix of employment by education and occupational segment 1996-current year from Labour Force Survey.**
- 3. Forecasting: forecast of replacement demand by education, Supply by education and unemployment in current year.**

Questions?

