Purchase Productivity in Dutch Youth Care:

Locally Least Squares Frontier Method Applied to Municipality Data

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https://www.ipsestudies.nl/wp-content/uploads/2024/06/AR2301-Purchase-Productivity-in-Youth-Care-Complete.pdf

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Outline

- About youth care in the Netherlands;
- Research questions;
- Methodology;
- Data;
- Results;
- Conclusions.

Characteristics of youth care in the Netherlands

- 1. Types of youth care:
  - ✓ Youth aid (physical and mental issues);
  - ✓ Youth protection (child abuse);
  - ✓ Rehabilitation (youth crime).
- Responsible authority: municipalities;
- Services generally provided by private care firms;
- Purchases by municipalities by tendering.

Research questions

- ❑ What is the cost efficiency of providing youth care services?
- ❑ What are the main purchase features that affect cost efficiency of youth care services?

Methodology: cost model

$$\ln(c_l) = a_0 + \sum_m b_m \ln(y_{lm}) + \sum_o \delta_o env_{lo} + obeff_l + unobseff_l + err_l \quad (3)$$

Where:

c_l = actual costs municipality *l* ;

y_{lm} = production of service *m* by municipality *l*;

env_{lo} = percentage of deviating costs municipality *l* due to environmental feature o;

$obeff_l$ = percentage of additional costs due to observed inefficiency municipality *l* ;

$unobeff_l$ = percentage of additional costs due to unobserved inefficiency municipality *l* ;

err_l = measurement error municipality l.

Methodology: cost model

$$obeff_l = \exp[-\sum_k \theta_k z_l] \quad (4)$$

z_{dtk} = characteristic *k* of department *d* at time *t*;

See Alvarez, A., Amsler, C., Orea, L., & Schmidt, P. (2006). Interpreting and testing the scaling property in models where inefficiency depends on firm characteristics. *Journal of Productivity Analysis*, *25*(3), 201–212.

$$unobseff_l = \frac{\exp(-\hat{v}_l)}{p90[\exp(-\hat{v})]} \; if \; expression \leq 1, otherwise \; eff_l = 1 \quad (5)$$

Where:

$\hat{v}_l$ = observed residual from regression analysis for municipality l ;

$p90$ = 90^{th} percentile.

(adjusted COLS)

Methodology: locally weighted least squares

- ✓ Weighted regression for each municipality separately
- ✓ Weights based on distance to observation under investigation

$$weight_i = \left[1 - \left(\frac{d_{il}}{max d_l}\right)^3\right]^3 \quad \forall i \in \omega(l), otherwise\ weight_i = 0 \qquad (6)$$

$$d_{il} = \sum_m |y_{im} - y_{lm}| \qquad (7)$$

With:

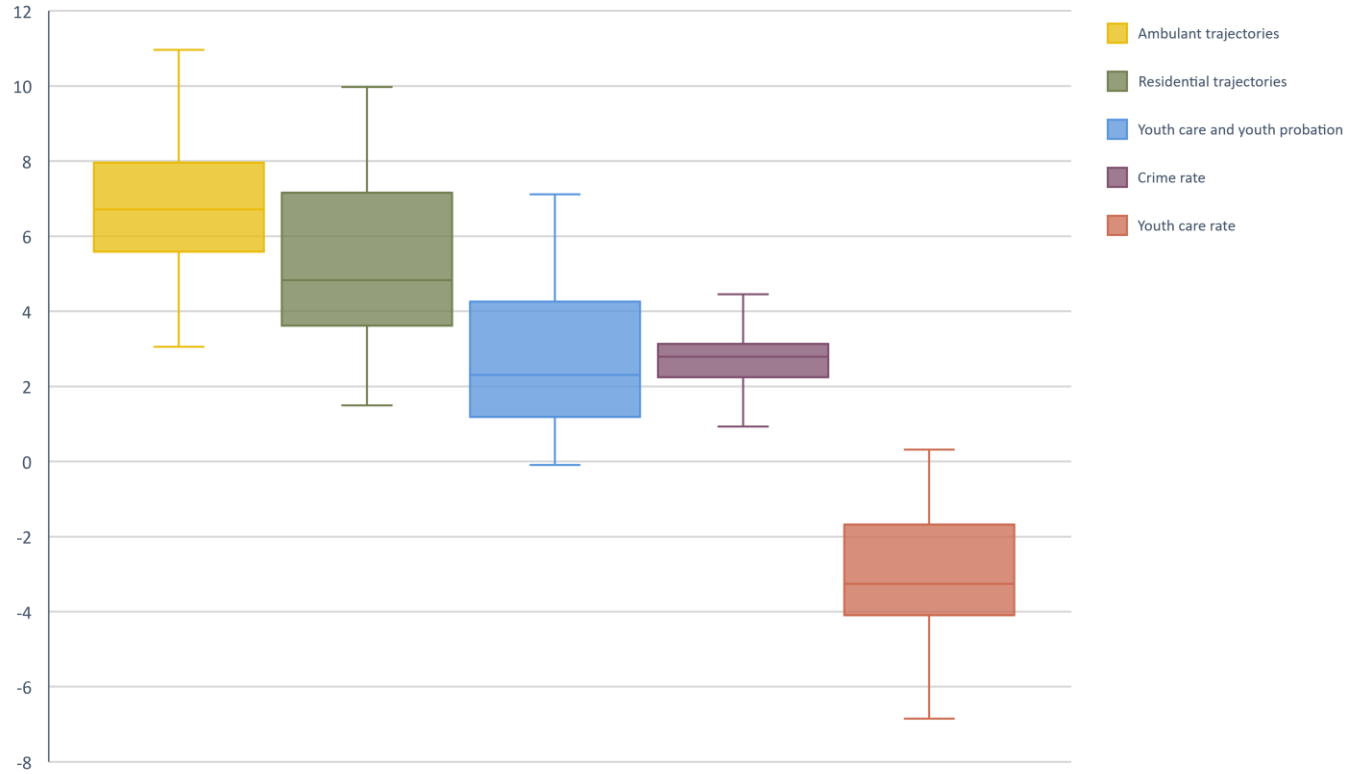
d_{il} = distance from I to l

$\omega(l)$ = set of nearest neighbours of l

Data

Variable	Mean	St. Dev.	Minimum	Maximum
Inputs				
Total cost (x 1,000 euro)	15,045	22,730	205	26,800
Production				
Ambulant trajectories	1,745	2,497	10	27,765
Residential trajectories	149	205	0	2020
Youth care and youth probation	156	255	0	2910
Environment				
Crime rate (crimes per capita)	0.03	0.01	0.01	0.07
Youth care rate (youth with care per capita 0-18 years)	0.15	0.03	0.06	0.27
Purchasing features				
Open house	0.34	0.42	0	1
Dialogue and Zealand	0.44	0.43	0	1
Intermediate access	0.51	0.39	0	1
Budget constraint	0.13	0.29	0	1
Production funding	0.62	0.36	0	1
Integrality Social support Act	0.27	0.38	0	1
Collaborating municipalities	11.08	4.7	1	21.57
Duration of contract (years)	2.86	1.1	0.93	5

Estimated parameters production and environment variables (and t-values)



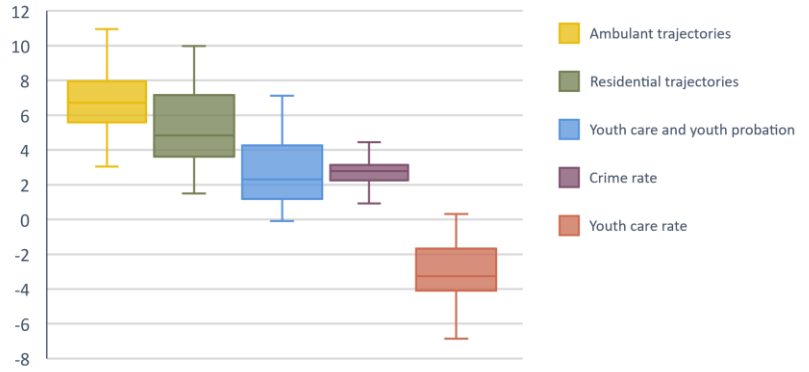


Figure 3 Parameter estimates of effects of purchasing features on cost (and t-values)

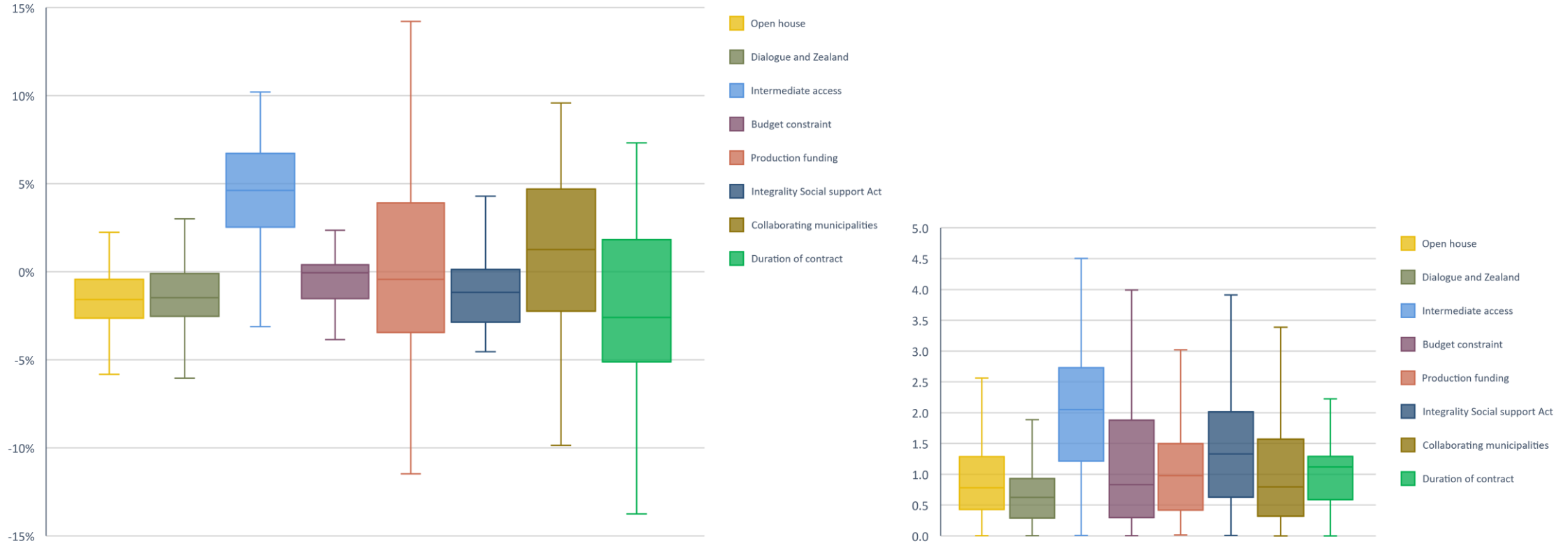


Figure 5 Purchase features related efficiency scores

Mean = 0.80

Figure 6 Unobserved efficiency scores

Mean = 0.78

Quality/outcome effects

Correlation between “completion as planned” and cost efficiency ➔ rejected

Correlation between “repeated recourse” and cost efficiency ➔ positive

Conclusions

- Significant variations in the cost efficiency of youth care provision ;
- Cost efficiency partially attributed to differences in the design of purchase policies.

  Instruments that work:
  - ❑ negative effect of a framework agreement with intermediate access;
  - ❑ open house procedure has a positive effect on cost efficiency
- No trade-off between quality and cost efficiency (limited research)
- There also are some relevant environmental variables (crime rate, entrance selection)

Thank you

Questions?