Starpath:
Target setting concepts

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Starpath
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THE UNIVERSITY OF AUCKLAND
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Te Whare Wānanga o Tāmaki Makaurau

Target Setting

Job of Student Achievement Manager (SAM)

Individual student target setting dependent on longitudinal data (going back up to 3 years)

Takes into account prior achievement and cohort effects

Whole school and group achievement targets for NCEA levels and UE qualifications are done by aggregating individual student targets.

Can be compared with internal teacher estimates of individual students (e.g., from traffic lights), & monitoring data

Subject leaders can use a similar process and relevant data to estimate targets for their subject

Purposes of setting targets is to:

- Inform school goals and set benchmarks based on evidence
- Challenge teacher beliefs about student achievement

What is DEA (Data Envelopment Analysis)?

Primarily used in operations research and economics

Form of linear programming

Used to measure the **efficiency** of productive units (e.g., bank branches) using set of inputs (e.g. labour, capital)

Draw a 'data envelope' around upper bounds of data to indicate maximum levels of efficiency for a given level of input

Involves complex mathematics

DEA in education

Limited but growing …

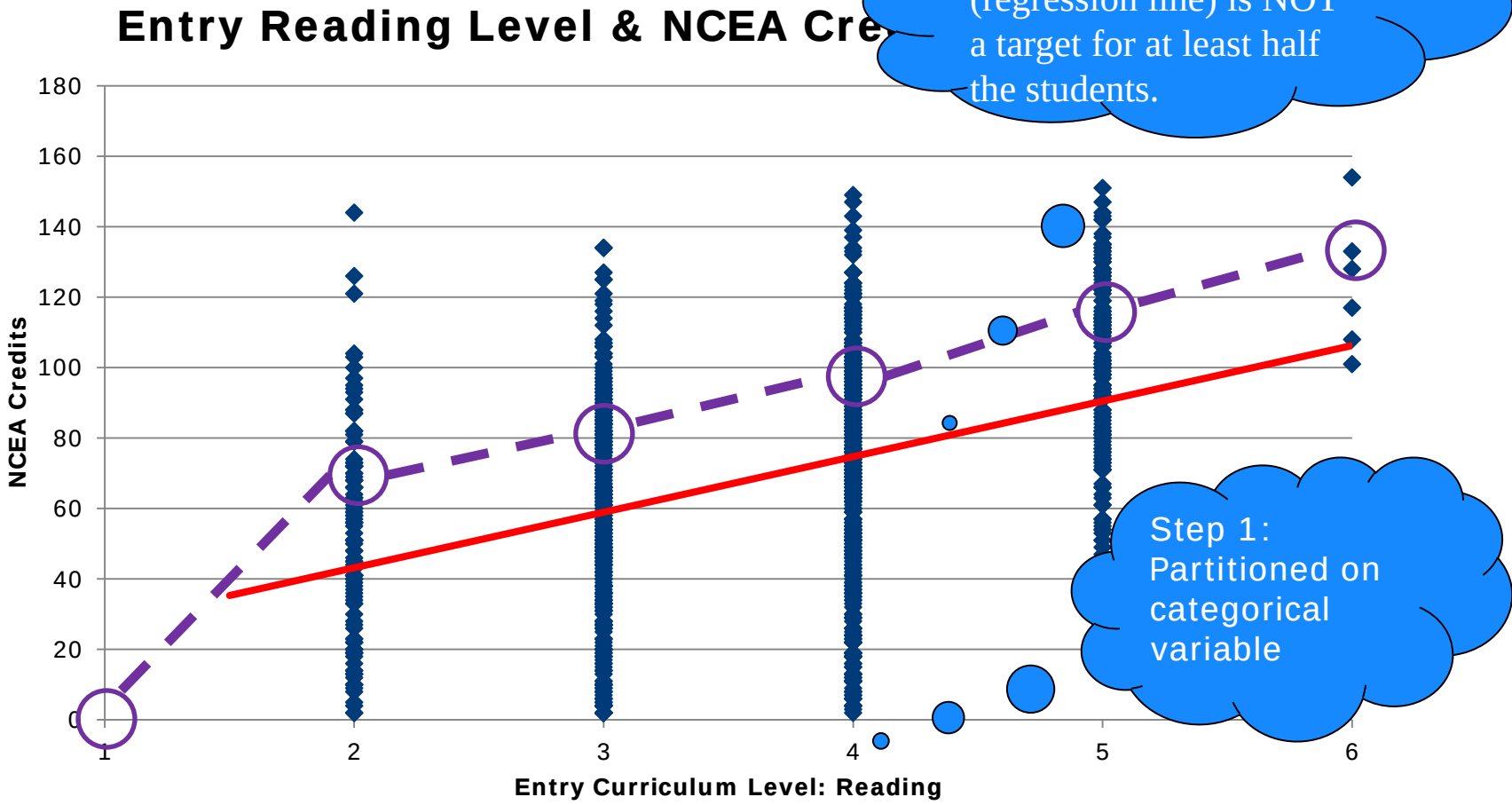
1. Thanassoulis, 1999 – for setting achievement targets
2. Thanassoulis & Portela, 2002 – to calculate a form of value-added analysis
3. Turner, 2005 – benchmarking UK universities
4. Smith, 2009 – Sam's thesis informed the simplified Starpath process we use.

Three step process (Thanassoulis, 1999, p.104)

1. Partition student into groups which offer the same values on the categorical variables
2. Allow for the impact of random noise and unidentified contextual variables on student achievement
3. Solve the appropriate DEA model to estimate targets at student level and to identify efficient peers for each under-performing student

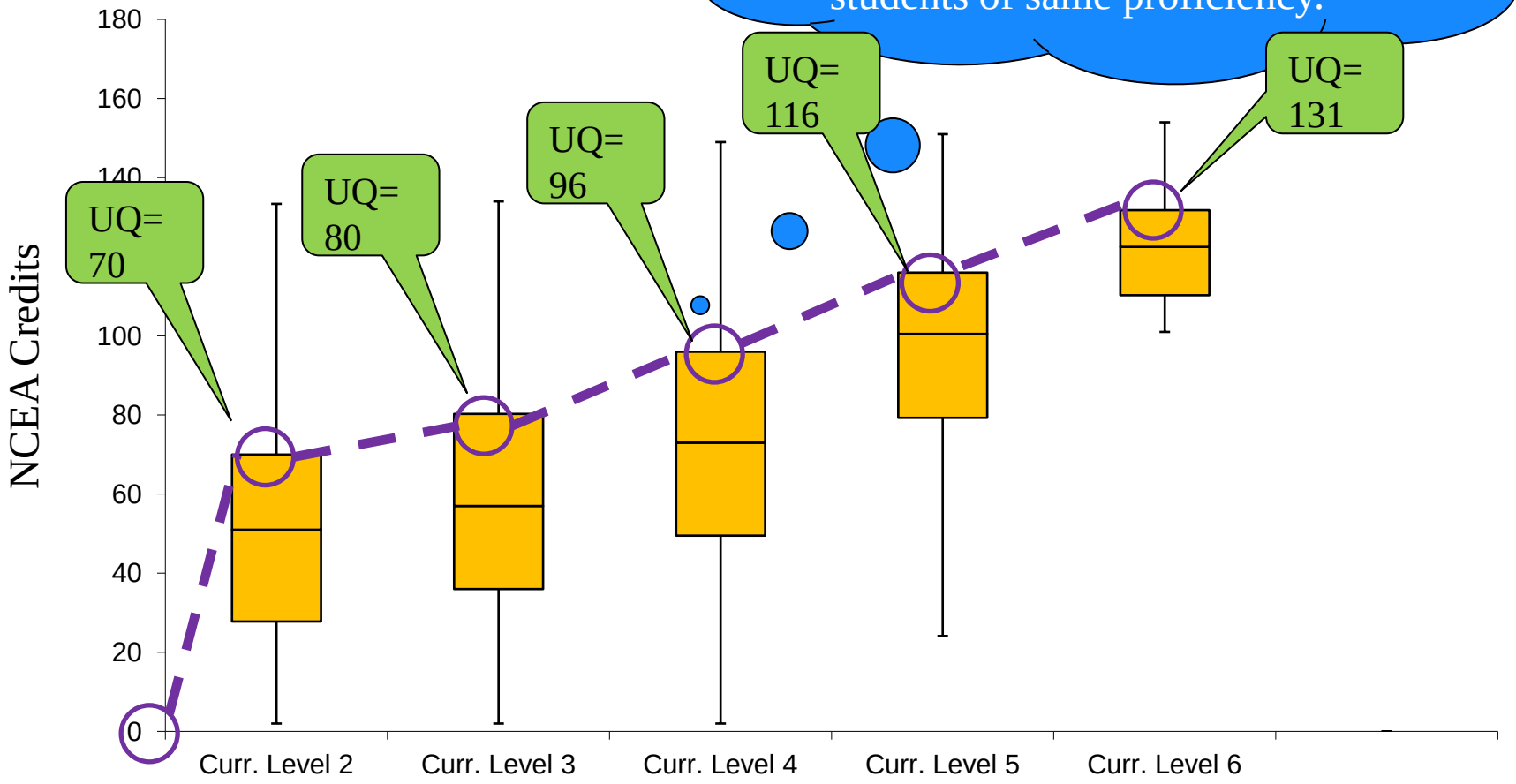
Conceptualising DEA targets

(adapted from Thanassoulis, 1999)



Box and whiske

Step 2: 75th percentile (UQ) allows for random noise, outliers etc. i.e., identifies 'efficient' peers for other students of same proficiency.



Entry Curriculum Level: Reading

Table of 75th percentiles

Curriculum Sub-Level	Y9 T1 aRs	Y9 T1 a	
2P	56		
2A	54		
3B	59	66	
3P	61	62	66
3A	69	69	69
4B	71	71	71
4P	74	73	72
4A	78	78	79
5B	83	85	84
5P	85	89	86
5A	89	93	89
6B	91	109	92

Could use sub-levels instead of levels if sufficient data, but unlikely.

Evidence not extrapolation to set targets for individuals → school

ID	Y9 T1 aRs	Est 1	Y9 T1 aMs	Est 2	Y10 T1 aRs	Est 3	Average	L1 Cert
1234	2P	56	2A	59	4B	71	62.0	N
6543	4B	71	4B	71	5P	86	76.0	N
8892	5B	83	-	-	5A	89	86.0	Y
9157	5A	89	4A	78	6B	95	87.3	Y

∴ School target for L1 = 50%

Does it work?

Modelled with historical data for three cohorts to estimate credits for a new cohort (n=333).

Used Y9/10 data to estimate L1 credits – what we will do today.

Compared estimated credits with actual credits – correlation was statistically significant.

Success classification also statistically significant – i.e., false positive and false negatives were minimised.