

# Trends in examination performance: comparing results by exam board

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# Testing in wales 2003 - 2014

- Around 2003 Wales abolished standardised testing in schools and ceased publishing league tables based upon examination results.
- Until 2012 it was noted that Welsh examination results declined in comparison to England as did their relative position in PISA tests on 15 year olds.
- Inferring causality is difficult, given plausible alternative explanations (abolition of league tables; abolition of standardised testing; changing 'standards' among exam boards)
- I will look at changes among exam boards to try to ascertain whether changes are 'real'

# Exam board equivalence?

- A widespread acceptance that exam board gradings are 'equivalent', but this is a matter for debate and no universal agreement.
- Until around 2003 WJEC GCSE (most taken in wales) and English boards used KS2 tests to 'adjust' GCSE grades – not perfect but generally accepted.
- Following 2002 this was not possible so that a drifting apart of 'standards' might contribute to relative movement of results (WJEC becoming 'harder').
- NPD data available 2004-2011 for non-Welsh children many of whom took WJEC.

# GCSE English by exam board (English schools)

	2007	2008	2009	2010	2011
AQA	38.9 (428478)	39.2 (423637)	39.5 (408544)	40.3 (404325)	40.9 (392509)
OCR	38.4 (40395)	38.5 (32967)	39.2 (28503)	40.2 (23927)	41.0 (220120)
Pearson	38.9 (24697)	40.2 (21229)	40.7 (18257)	41.3 (17912)	42.2 (17188)
WJEC	38.1 (72272)	38.8 (84466)	39.0 (90681)	39.4 (102306)	39.8 (108249)
Total	38.8 (565842)	39.1 (562992)	39.5 (545985)	40.2 (548470)	40.7 (539958)
WJEC all 5 years*	38.5 (62011)	39.2 (64906)	39.5 (64259)	40.0 (65203)	40.6 (64184)
WJEC Wales schools only**	38.0 (45908)	38.1 (45464)	37.1 (45559)	36.9 (49204)	35.4 (37971)

\*\* data supplied by WJEC: \* Schools with at least one WJEC all years

- Note rapid increase in numbers taking WJEC in England and relative sharp decline in Welsh schools.
- Prima facie evidence of a real decline – not attributable to exam board differences
- Now for some formal modelling:

**Table 2. Grade score related to year, WJEC exam board, and KS2 scores.**

	A	B	C	D
<b>Intercept</b>	38.34	38.63	38.60	38.36
<b>WJEC</b>	-0.807 (0.048)	-2.092 (0.069)	-0.272 (0.053)	-2.715 (0.093)
<b>Year</b>	0.437 (0.004)	0.386 (0.004)	0.387 (0.004)	0.385 (0.004)
<b>KS2</b>		0.548 (0.001)	0.548 (0.001)	0.548 (0.001)
<b>Year * WJEC</b>	0.056 (0.011)	0.058 (0.010)	0.123 (0.020)	0.240 (0.023)
<b>KS2 * WJEC</b>		0.063 (0.002)	0.063 (0.002)	0.063 (0.002)
<b>WJEC-all</b>			0.567 (0.220)	-0.303 (0.235)
<b>WJEC-all * Year</b>			-0.079 (0.021)	0.172 (0.061)
<b>WJEC-all*WJEC</b>				1.367 (0.133)
<b>WJEC-all*WJEC*year</b>				-0.387(0.066)
$\sigma_v^2$	1.915 (0.331)	1.915 (0.296)	1.920 (0.293)	1.910 (0.297)
$\sigma_u^2$	17.286 (0.431)	11.498 (0.287)	11.484 (0.286)	11.456 (0.287)
$\sigma_e^2$	77.197 (0.066)	64.403 (0.055)	64.403 (0.055)	64.400 0.055)
<b>-2*loglikelihood</b>	19864374.2	19363080.7	19363048.6	19362957.4

# Results: value added

- Column B&C: The average score in 2007 for the WJEC students is relatively a great deal lower, but with a greater rate of increase over time. This would seem to support the interpretation that initially the academically weaker students were taking WJEC. The interaction with KS2 means that high achievers taking WJEC much closer to high achieving non WJEC takers than are low achievers.
- Column D: For those schools with students taking WJEC in all years the WJEC students in such schools are on average 0.74 units ahead of those not taking WJEC in remaining schools. In WJEC schools the WJEC exam takers do progressively better over time while in non-WJEC schools they do progressively worse..
- Reinforces inference of a real decline over the period, except for WJEC schools who tend to enter higher achieving (high KS2) students for WJEC exam than non-WJEC schools.

# Conclusions

- There appears to be a real decline in Welsh pupil test scores over our period following the abolition of regular testing in schools and abolition of school league tables.
- Use of exam board data also allows us to explore issues related to school entry policies – further exploration would be useful

# Measurement errors

- Measurement error in predictor variables will bias inferences
- Require generally knowledge of reliabilities – not available for NPD tests
- Assuming  $R=0.8$  for KS2 we get following comparison (simplified 2-level model) with a 2% sample

Parameter	No Meas error	Meas error $R=0.8$
Intercept	23.0	19.9
Year	0.56	0.56
KS2	0.51	0.63
WJEC	-0.103	-0.090
Level 1 variance	69.9	66.6
Level 2 variance	9.6	9.8

Note the decrease in Board difference and increase in KS2 coefficient.  
Seems to have little effect on school rankings.