

Efficiency, assessment and accountability in South African schools:

Lessons from comparing independent and public schools



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Plan

- To bring together evidence from several sources to consider indicators of efficiency across different sections of the school system
 - Independent vs public sectors
 - Historically different parts of the system
- Various sources of data that were merged to produce 2 datasets for the analysis presented
- Coming out of this, 2 factors affecting efficiency:
 - Accuracy of assessment and feedback
 - Parental commitment and accountability

Comparing independent and public schools

- This analysis courtesy of DoE
- Data used:
 - Community Survey 2007
 - Mainly demographic information
 - Senior Certificate 2006
 - Numbers writing and passing matric by school
 - Annual Survey of Schools 2005
 - School type, enrolment in each grade, school fees, total school expenditure, pre-1994 education department

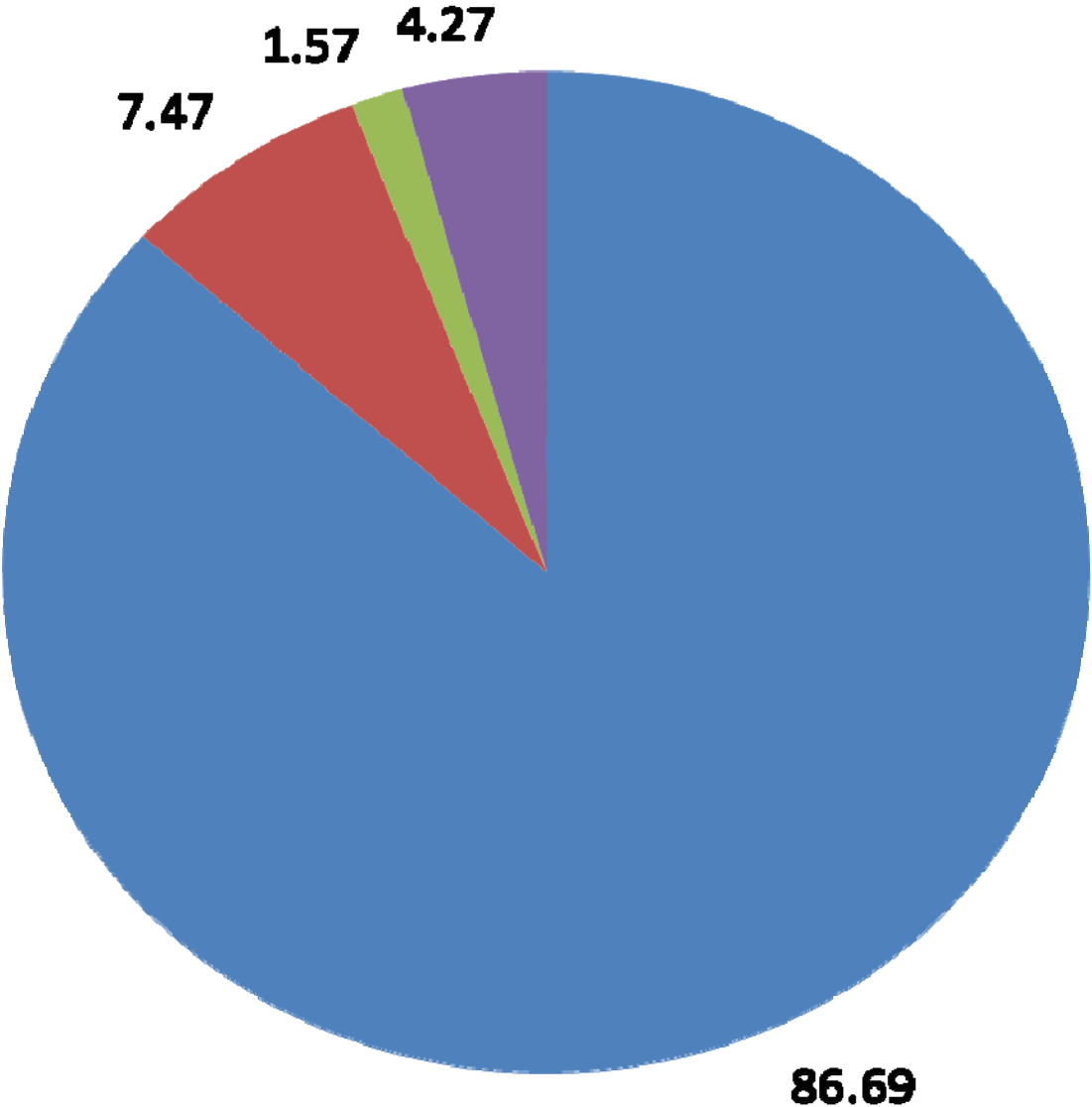
Annual school fees in the Independent School Sector in 2002

School Fee Category	%
R0-6000	52.9
R6001-12000	21.6
R12001-18000	11.7
R18001+	13.8

Source: Du Toit (2004)

Racial composition

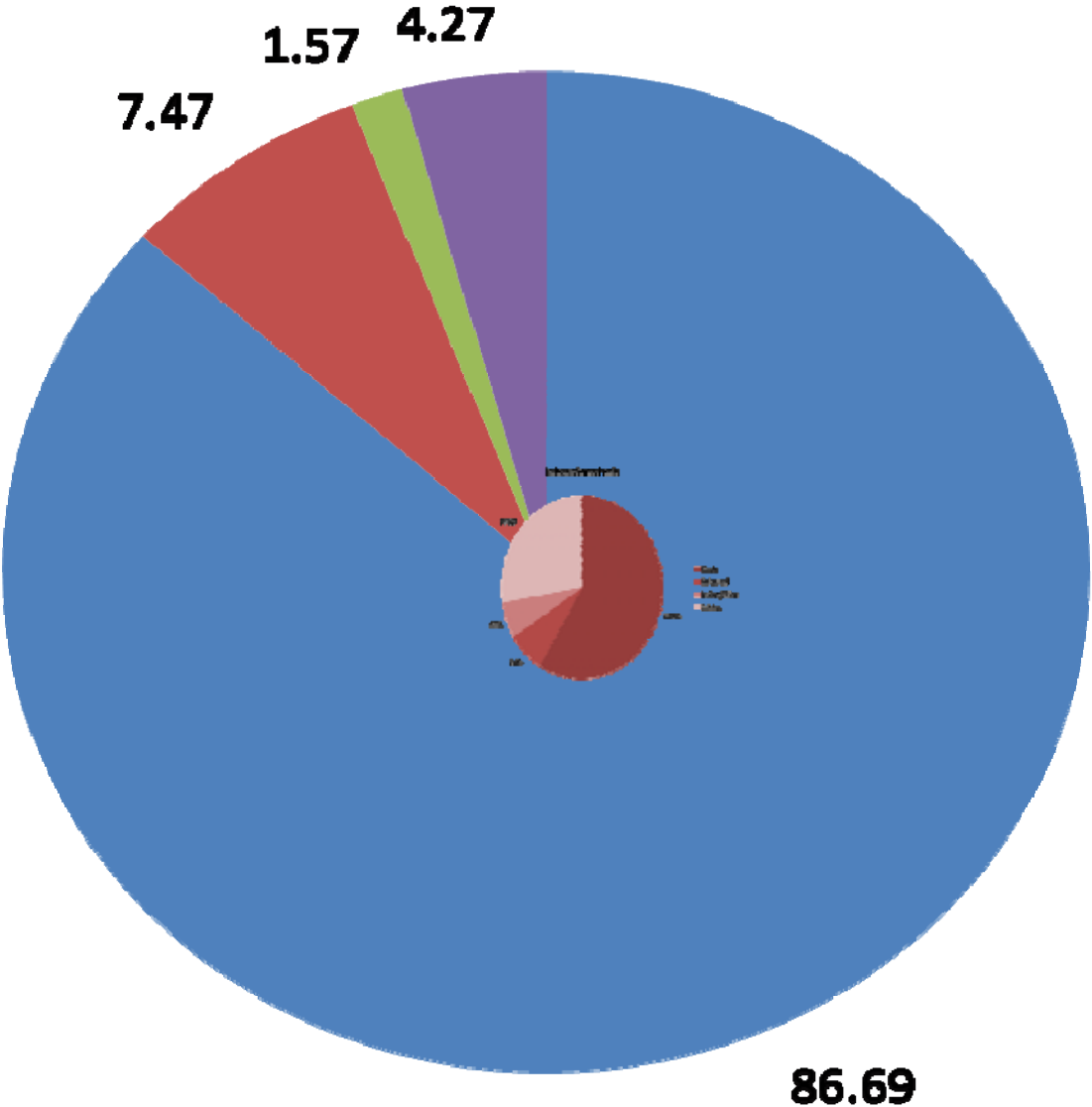
Public schools



- Black
- Coloured
- Indian/Asian
- White

Racial composition

Public schools

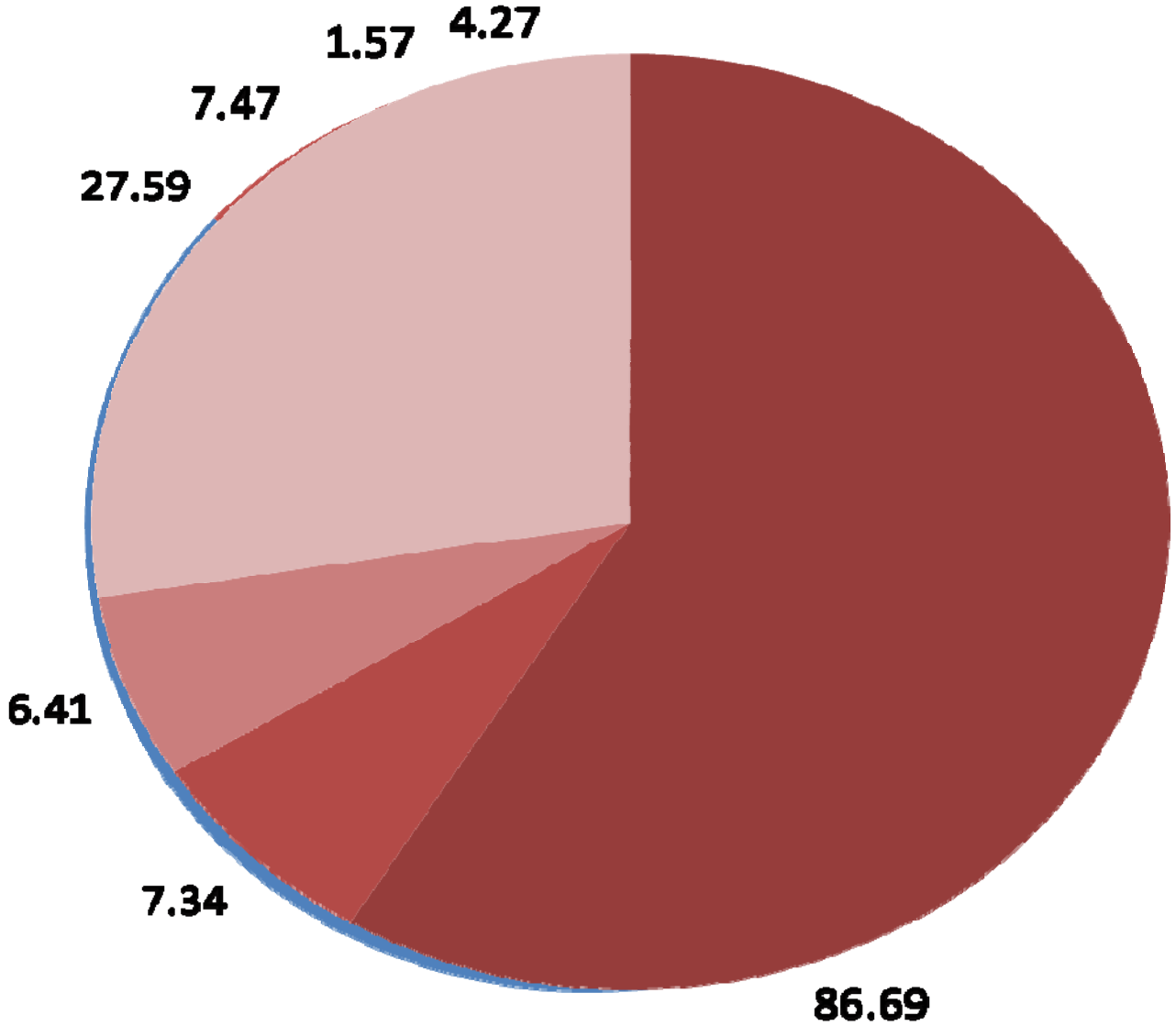


- Black
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Community Survey 2007

Racial composition

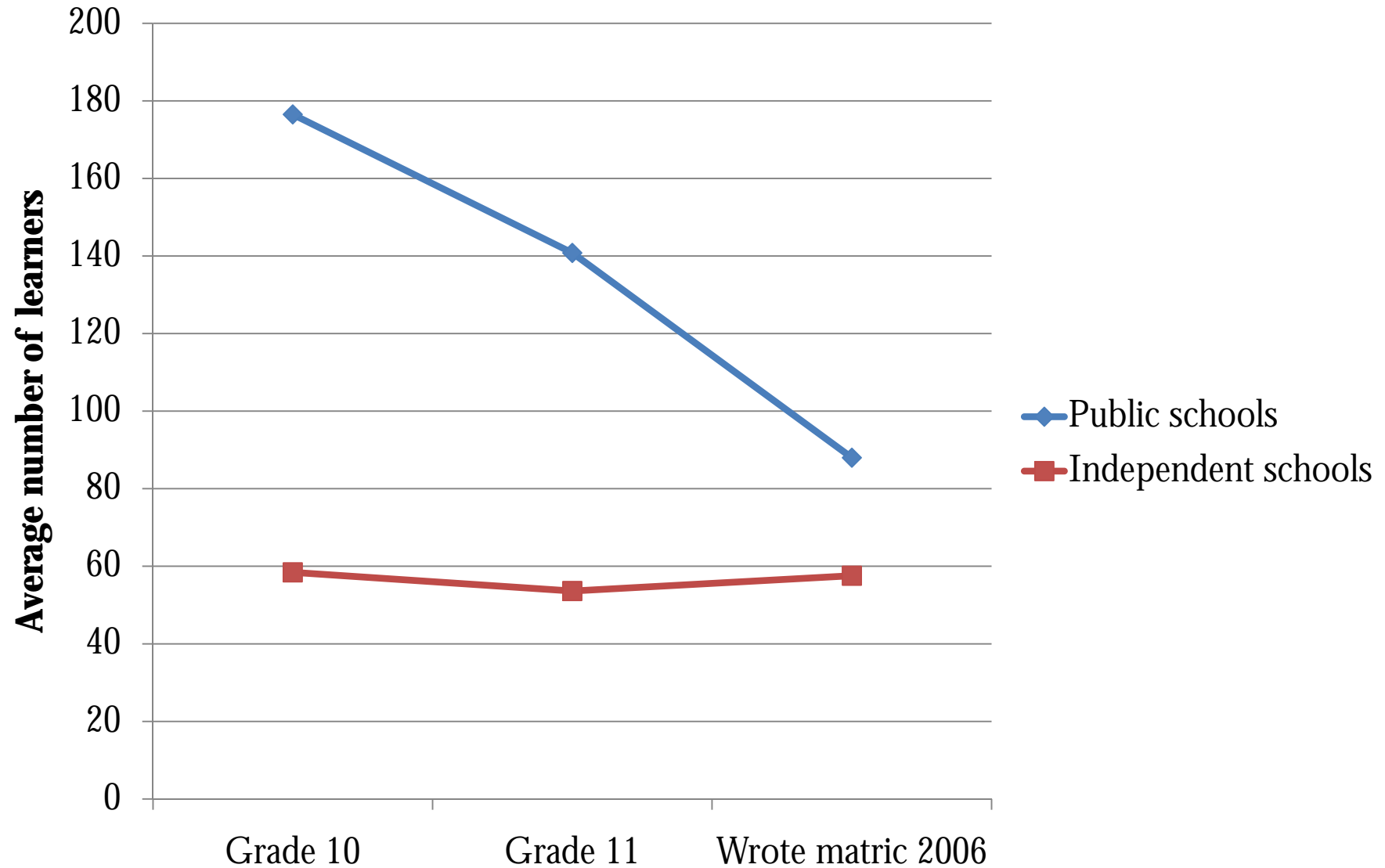
**Public schools
Independent schools**



58.66

Community Survey 2007

Average number of students by grade and school sector



Different versions of the average matric pass rate by sector

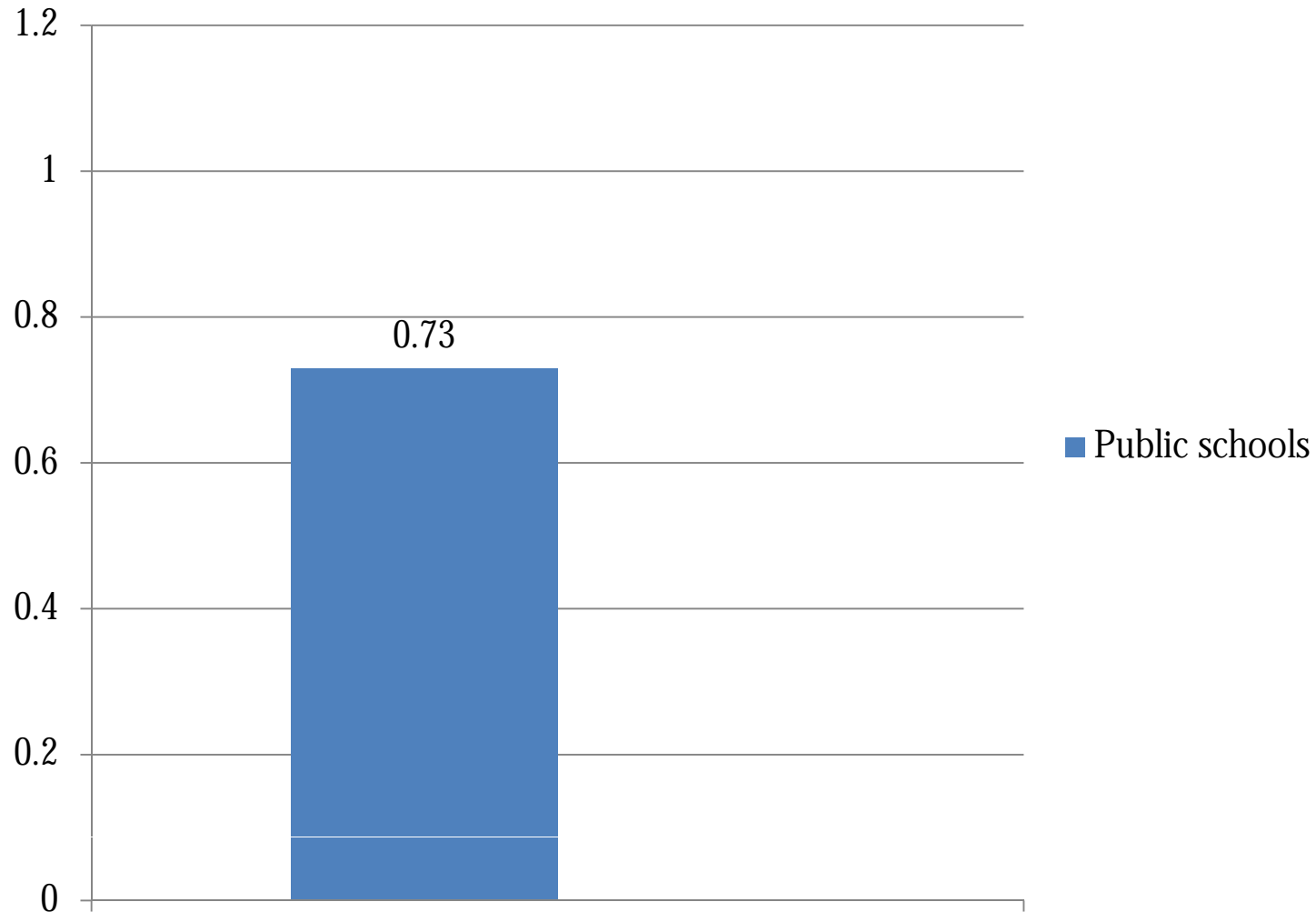
	Public schools	Independent schools	Total
Unweighted pass rate	65.1	77.1	65.7
Weighted pass rate	66.1	73.3	66.4
Unweighted adjusted pass rate	34.6	57.0	35.7
Weighted adjusted pass rate	38.1	59.4	38.7

Different versions of the average matric pass rate by sector

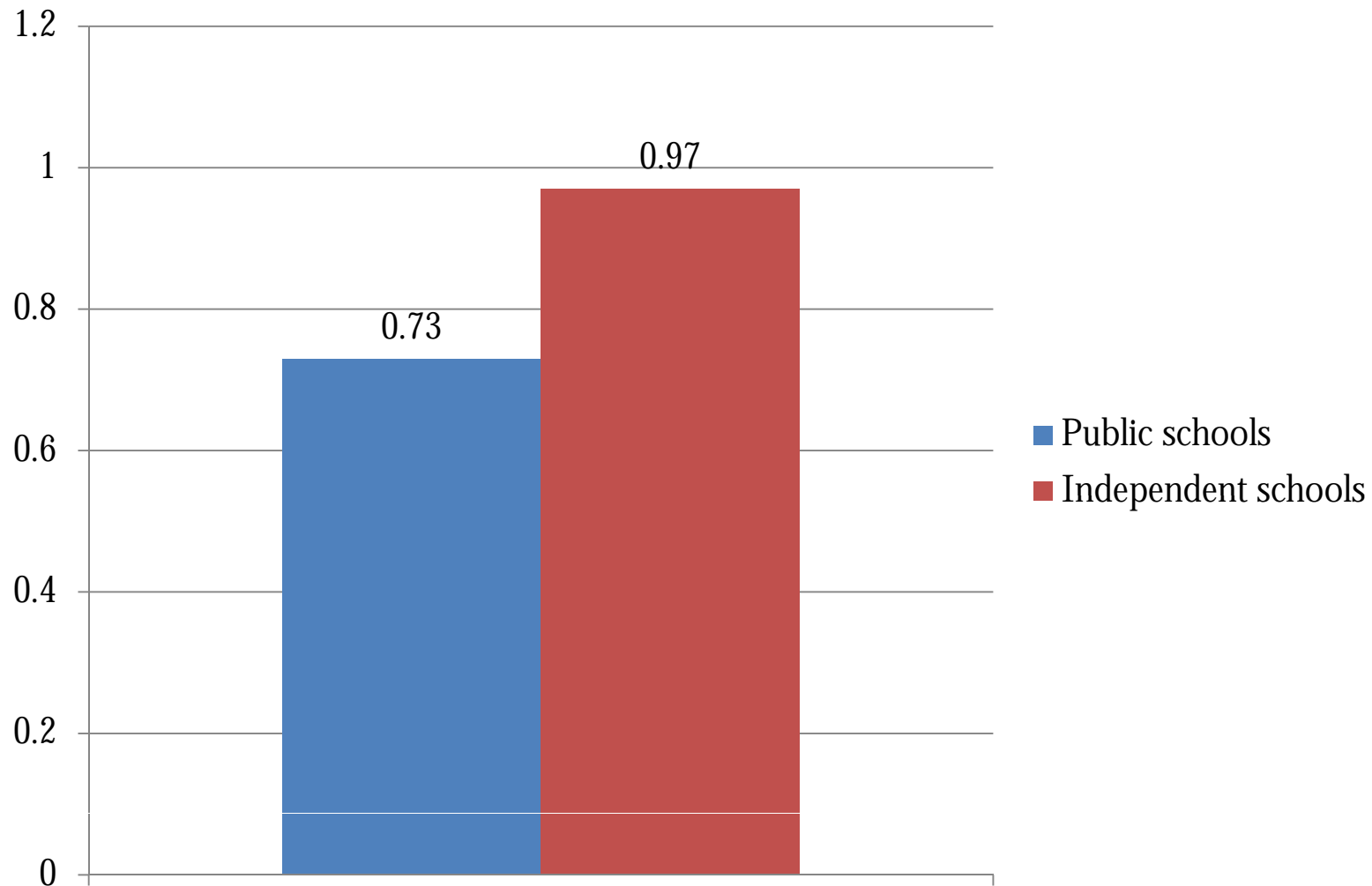
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Weighted pass rate	66.1	73.3	66.4
Unweighted adjusted pass rate	34.6	57.0	35.7
Weighted adjusted pass rate	38.1	59.4	38.7
Fees (weighted average)*	776.52	4007.84	869.1206
Expenditure per learner*	5135.82	7127.86	5198.48

* In rands

*Pass rate increment (percentage points) per
R100 of expenditure per student*



Pass rate increment (percentage points) per R100 of expenditure per student



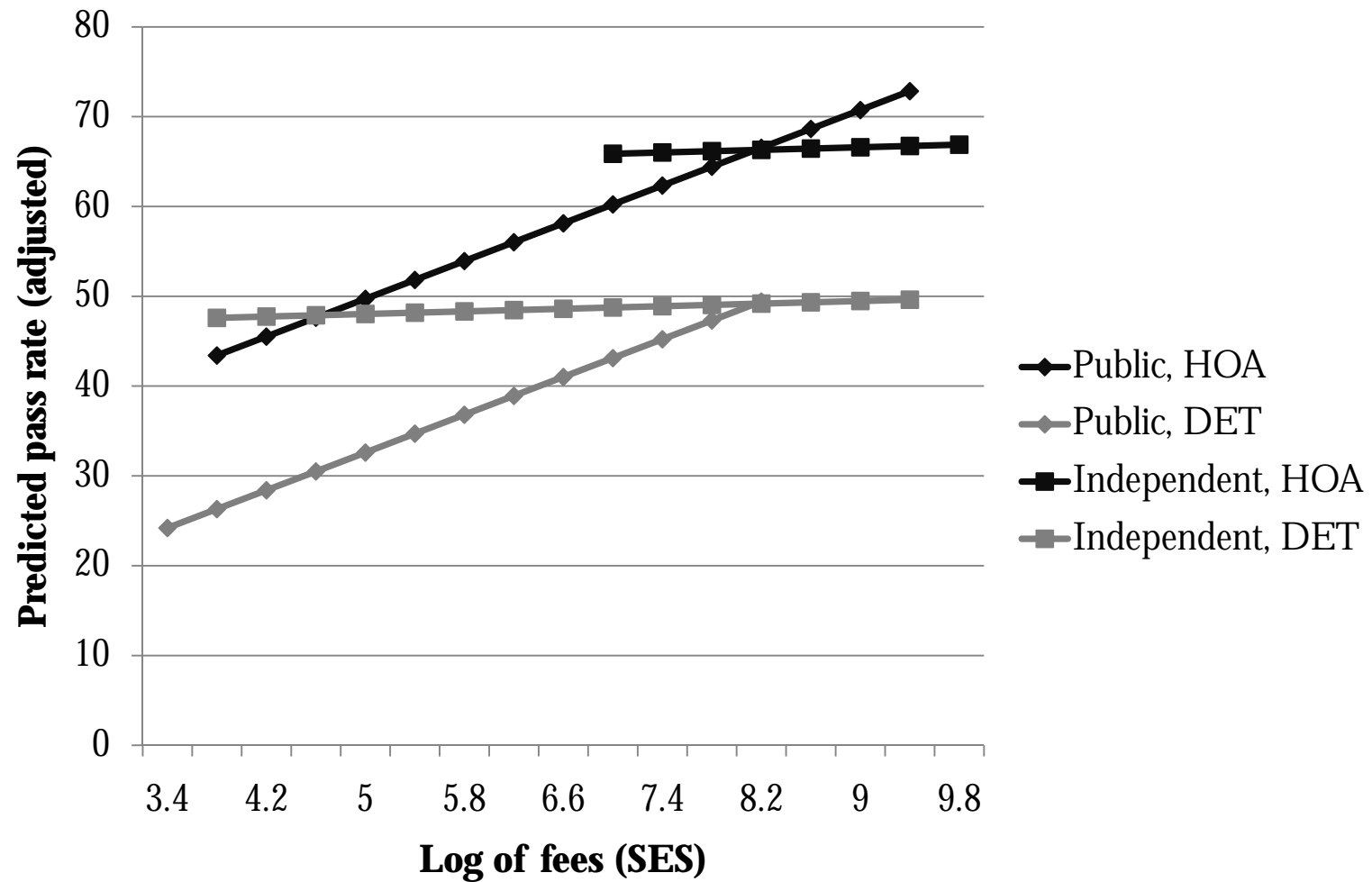
OLS regression 1:

**Dependent variable:
adjusted pass rate**

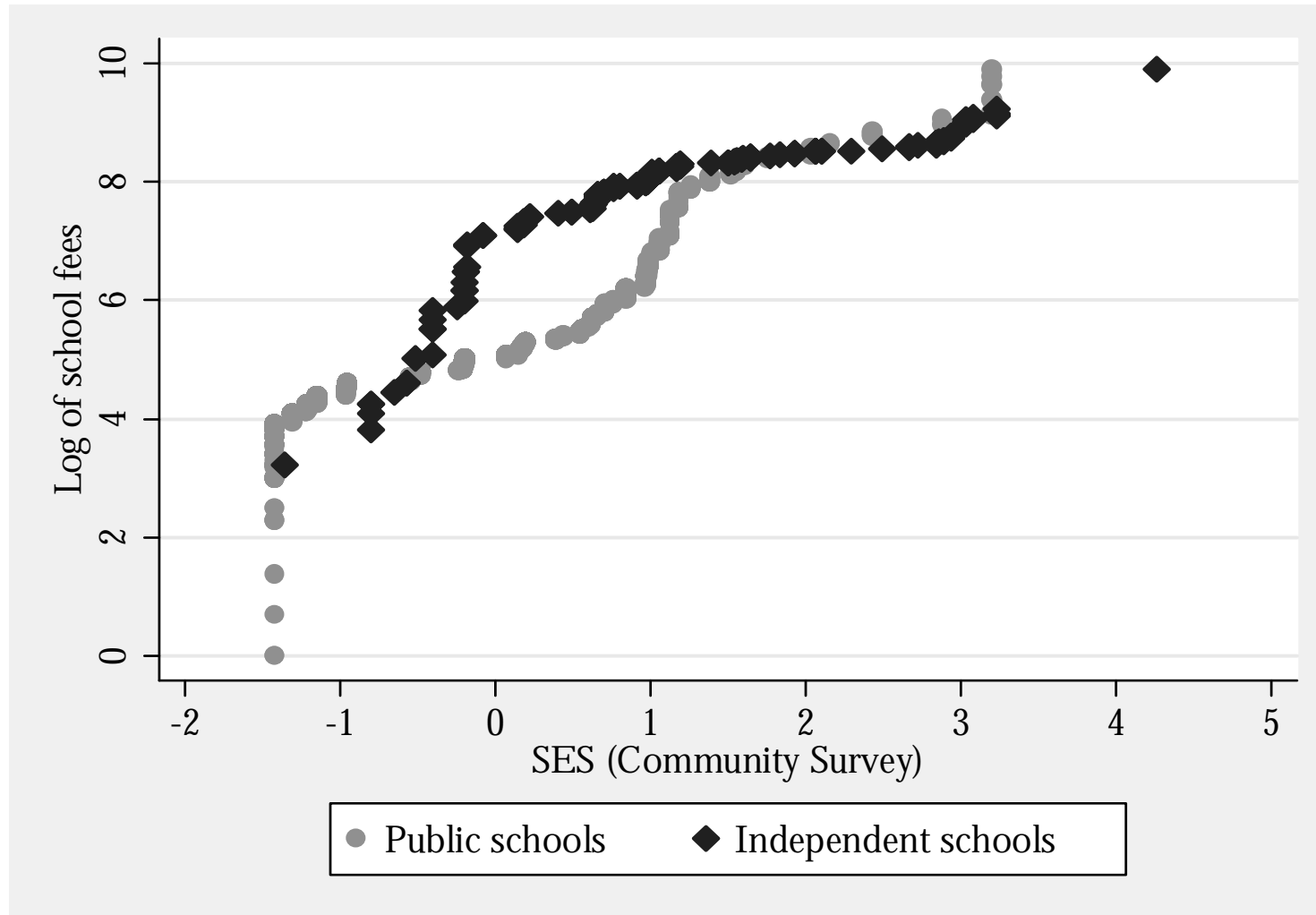
Log of funds per student	17.38 (13.80)**
Independent school	39.84 (5.61)**
Log of fees	5.24 (18.18)**
Log of fees_x_independent	-4.88 (5.36)**
HOA (W)	17.18 (15.52)**
HOD (I)	3.50 (2.84)**
HOR (C)	-2.74 (2.19)*
Constant	-141.12 (13.57)**
R-squared	0.5076
Observations	5089

*Significant at the 5% level **Significant at the 1% level
Absolute values of t-statistics in parentheses

Graphical representation of Regression 1



*Scatterplots of school fees by SES and school sector
(historically black schools only)*



The TIMSS-matric dataset

- Data courtesy of HSRC
- Vijay Reddy (HSRC), Dean Janse van Rensburg & Servaas van der Berg also worked on this analysis
- 8952 grade 8 students in TIMSS 2002
- 2734 successfully identified in matric (2006/2007 or both)
- Follow through of 31%
- GHS: follow through rate = 56%
- Thus a sample selection problem:
 - Impossible to know for sure whether a non-tracked individual dropped out of school or was simply “missed” in the identification process.

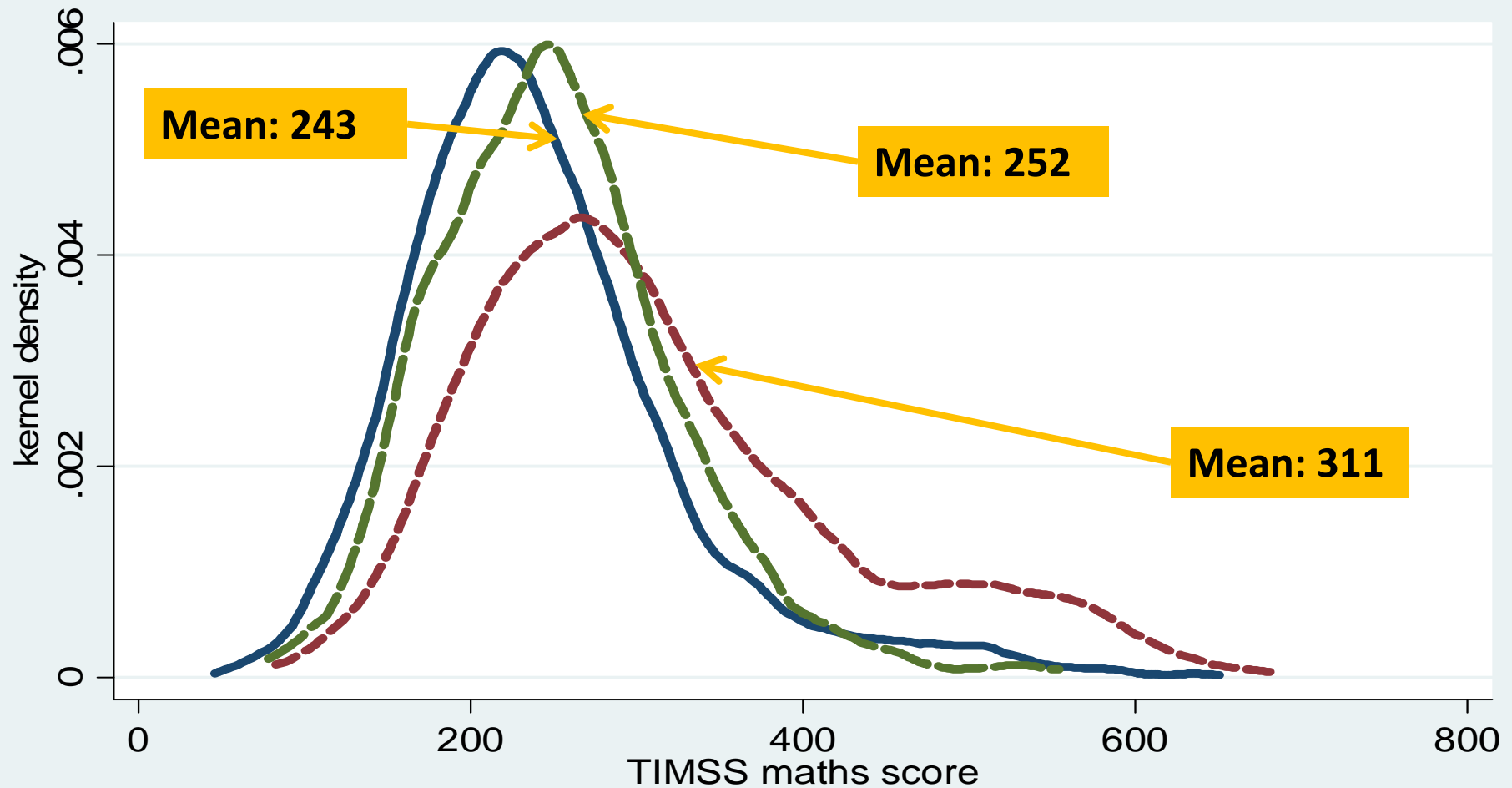
Weighting calculations (For those captured)

	TIMSS %	GHS %	$P=T\%/GHS\%$	Weight= $1/P$
Black	25.34	55.34	0.457896	2.1839
Coloured	47.2	53.56	0.881309	1.134676
Indian	47.06	88.08	0.534304	1.871594
White	73.86	86.65	0.852405	1.173151

Those captured in matric were weighted up by the inverse of the proportion of the capturing rate relative to the GHS follow through rate, for each race.

Similarly, those not captured in matric were weighted down, separately for each race in accordance with the GHS.

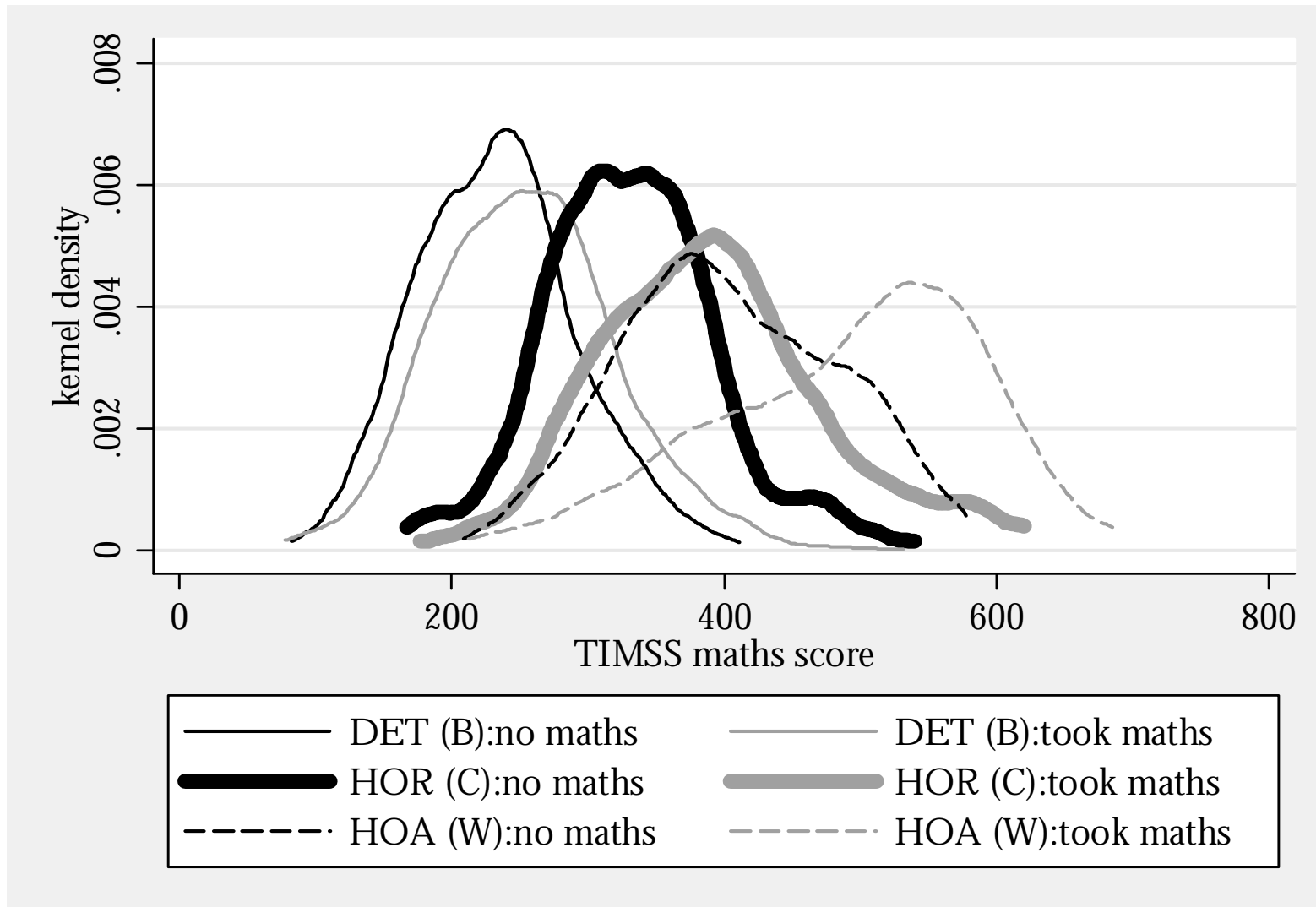
Kernel density of TIMSS maths by identification and matric year



*Mean TIMSS maths scores by ex-department
and matric cohort*

	matric 2006	matric 2007	Not tracked
DET (B)	256.68	232.21	219.97
	1162	620	5042
HOR (C)	367.54	317.83	303.12
	350	122	713
HOD (I)	398.59	308.4	331.48
	121	35	150
HOA (W)	473.29	404.22	422.84
	398	56	313

Kernel density curves of TIMSS performance by former department and participation in matric maths



Matric “pass rates” by race and ex-department (with weighting)

	Pass rate 1	Pass rate 2
Black/DET	65.22%	33.56%
Coloured/HOR	76.21%	36.57%
Indian/HOD	93.18%	74.52%
White/HOA	96.61%	71.29%
Total	72.28%	39.59%

Pass rate 1= those passed / those identified in matric

Pass rate 2= those passed / original TIMSS sample

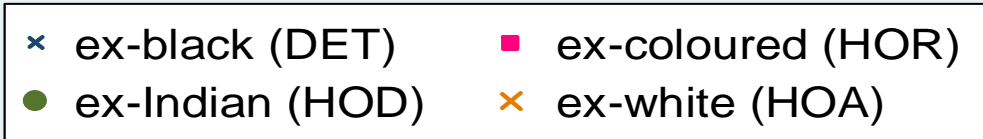
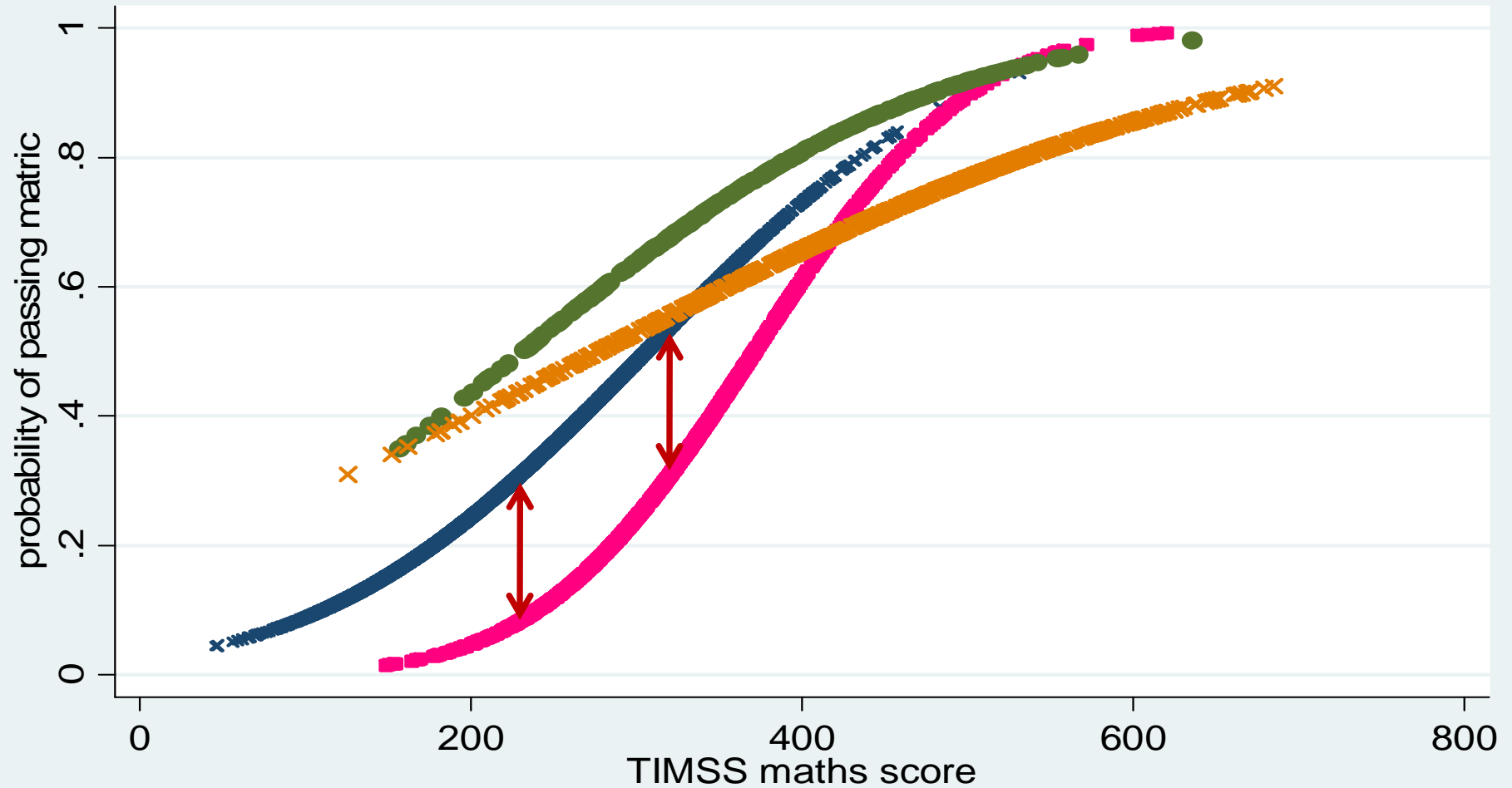
Probit regression predicting passing matrix

Dependent variable: Pass = 1; No pass = 0

Explanatory variables	Marginal effects coefficient	Standard error
TIMSS maths score	0.0025**	0.00016
HOR (C)	-0.4055**	0.038
HOD (I)	0.3101*	0.136
HOA (W)	0.4094**	0.091
HOR*TIMSS maths	0.0012**	0.00038
HOD*TIMSS maths	-0.0005	0.00039
HOA*TIMSS maths	-0.0012**	0.00027
Constant	-1.9970**	0.108
Observations	8752	
Pseudo R-squared	0.1362	

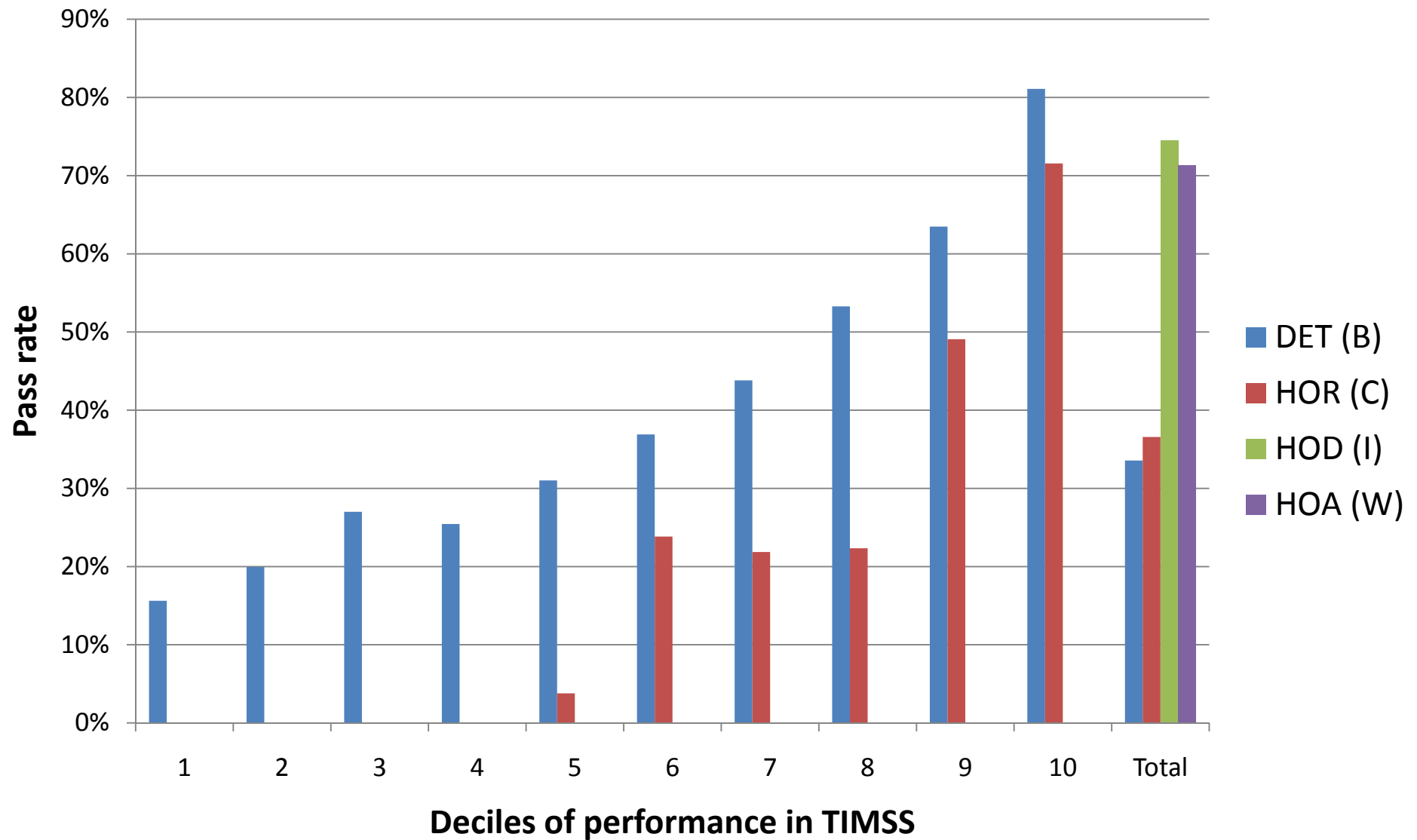
*Significant at 5% level **Significant at 1% level

Predicted probabilities of passing matrix



Matric pass rates by TIMSS performance and former department

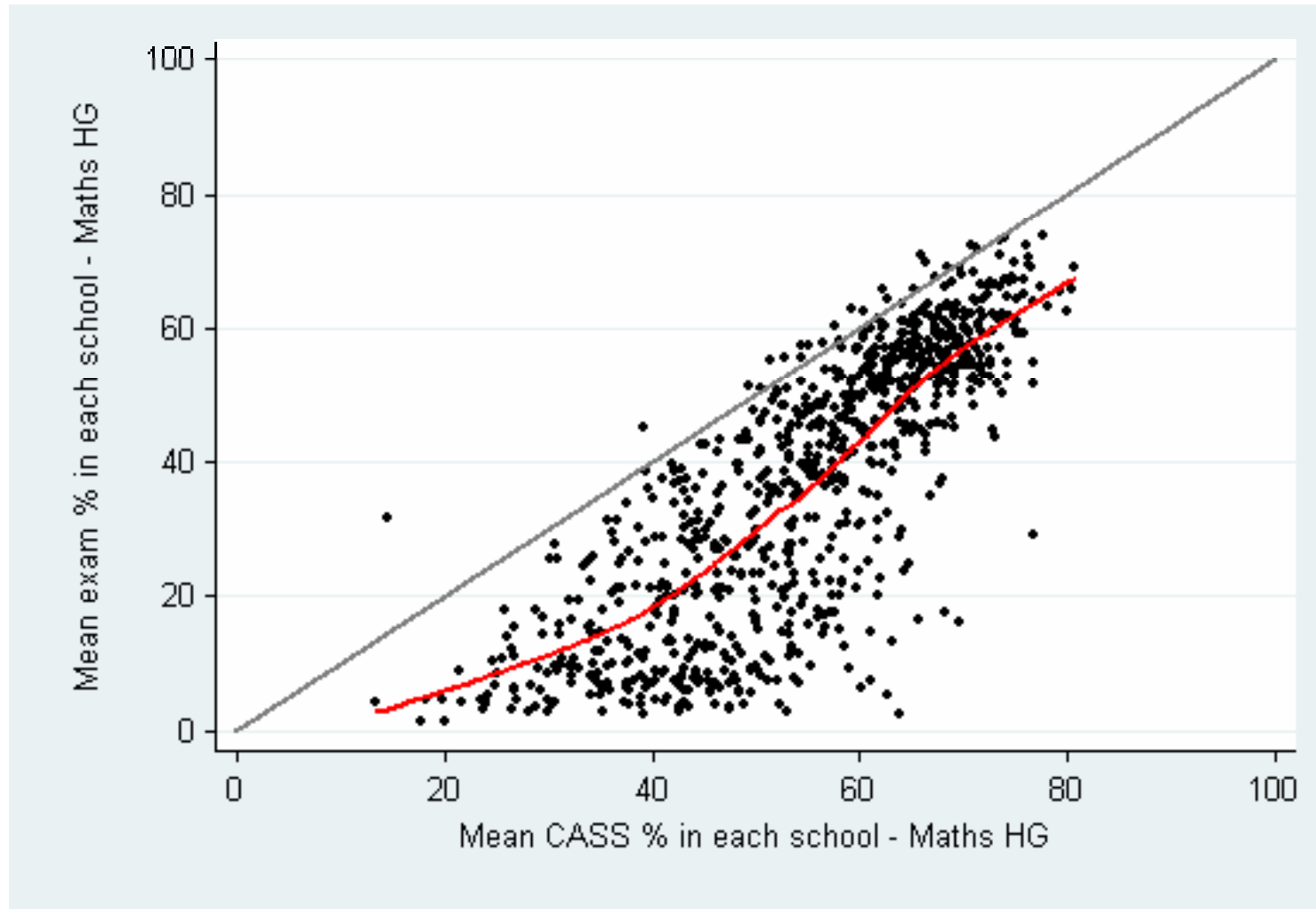
Pass rate = number passed / original TIMSS sample



Possible explanations

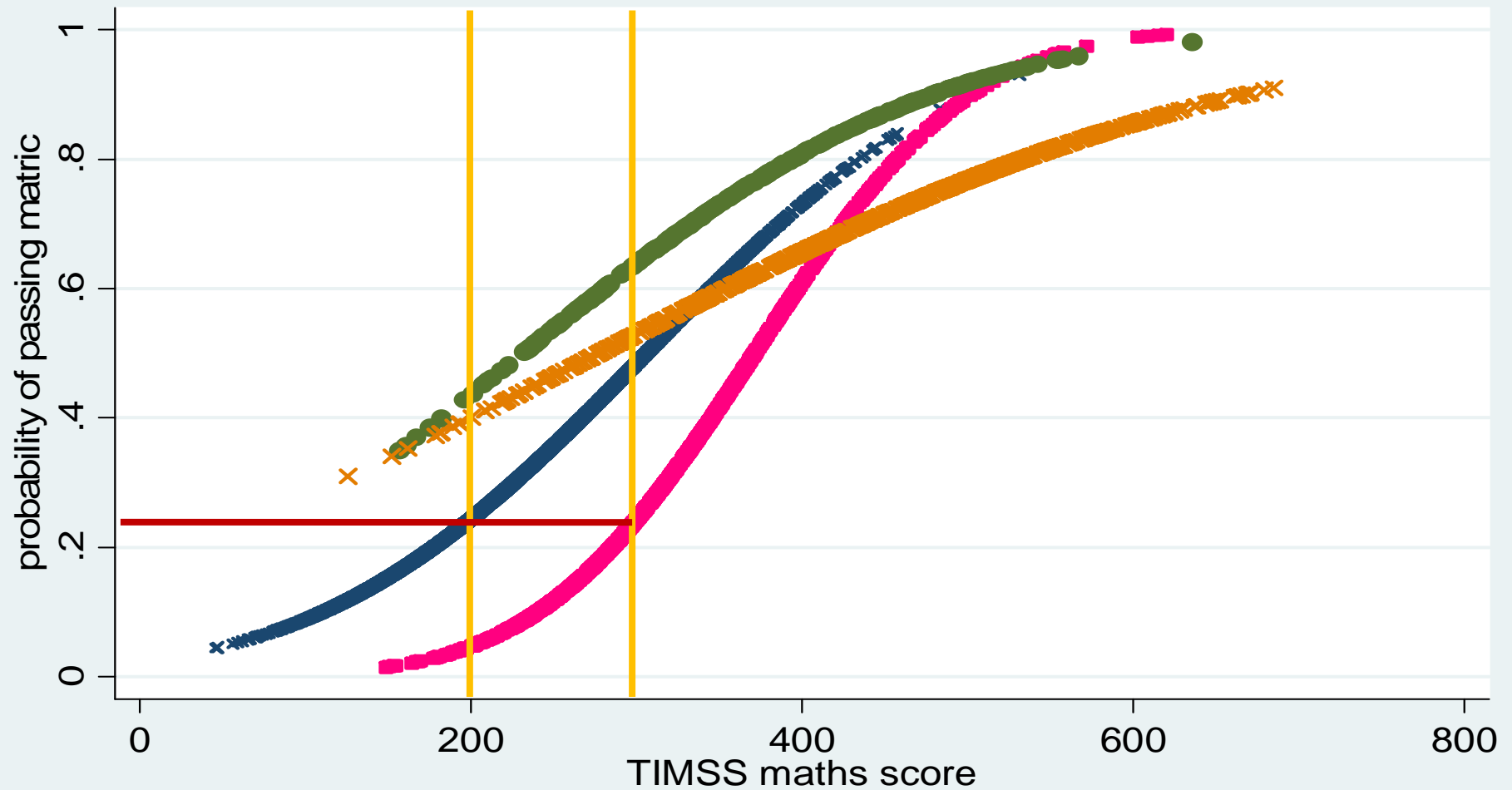
- Successful interventions in predominantly black high schools
- Under-utilisation of human capital in coloured schools (high drop out rate)
- Systematic underperformance of students in historically black schools in TIMSS, but not to the same extent in matric.
 - Assessment that does not do a good job of sorting students according to ability – lack of feedback to students.
 - Poor test writing skills at grade 8 in ex-DET school
 - Lam, Ardington & Leibbrandt (2008): large stochastic component in assessment and grade progression in schools attended by black students
 - CASS

*Continuous assessment marks and matric mathematics
HG 2005 and lowess regression trend line*



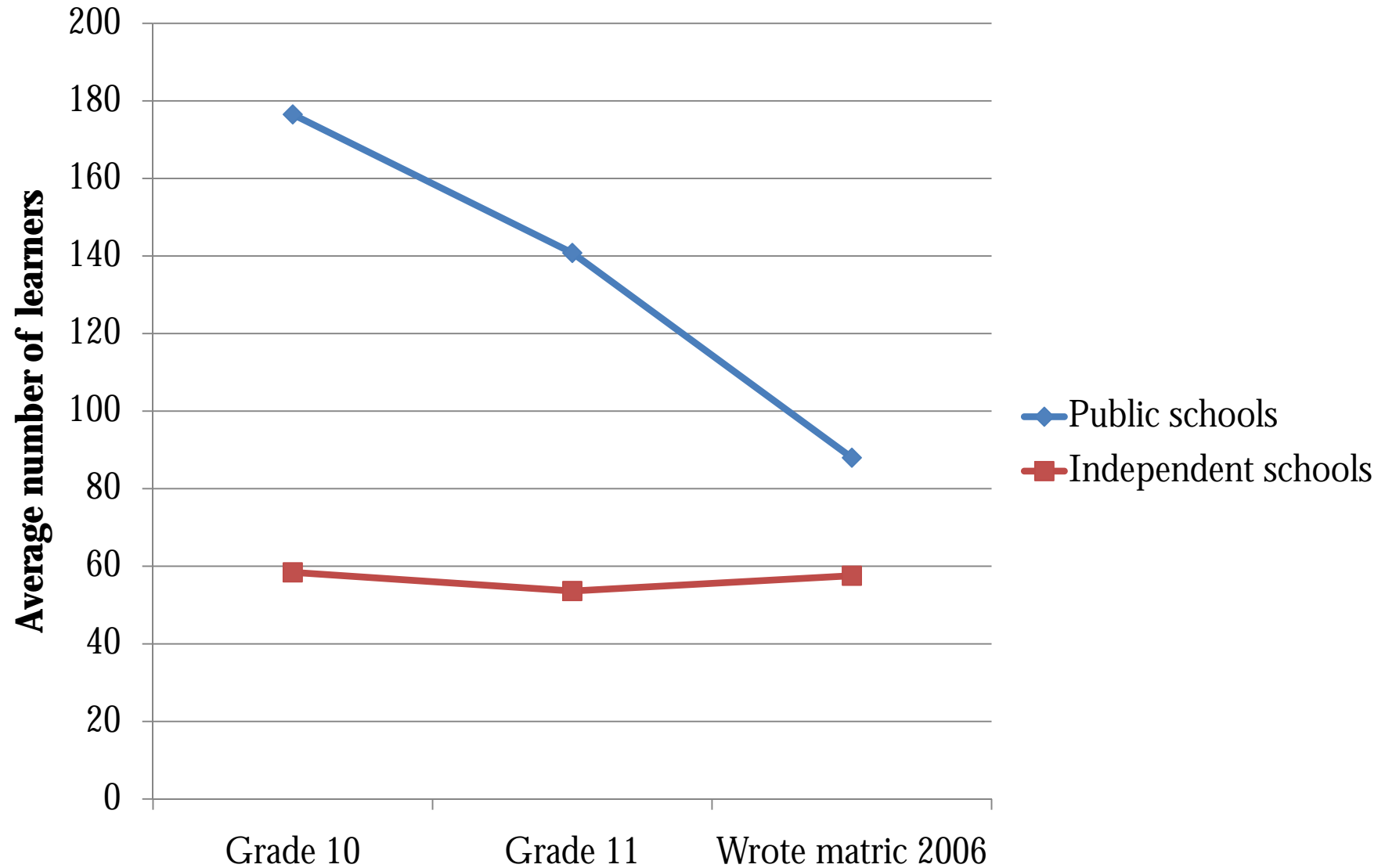
Source: Van der Berg and Shepherd (2008: 9)

Predicted probabilities of passing matrix (repeated)



- × ex-black (DET)
- ex-Indian (HOD)
- ex-coloured (HOR)
- × ex-white (HOA)

Average number of students by grade and school sector



Conclusions

- Apparent independent school efficiency advantage within the historically black part of the system
- 2 factors that partially underlie differences in efficiency differences across various parts of the school system:
 - Parent commitment
 - Accuracy of assessment and feedback
- Standardised assessments prior to matric could be expected to improve both these areas.