The power of national exams on teacher grading standards

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Motivation

- Research has been focused on getting people into higher education (**extensive margin**)
- Less attention given to which university and subject they decide to pursue (we will refer as programme)
- Heterogenous returns to **subjects** (Kirkeboen et al 2016) and **institutions** (Zimmerman 2019, Mountjoy 2022). Also, large variation in **student abilities** and learning style.
- **Teacher grades** in high school are used as a **allocation criteria** to allocate students to higher education. They gain particular relevance in degrees with high returns (elite programmes associated to higher entrance grades)

Institutional setting: general upper secondary education

Educational Components	Subjects	
General	Portuguese (3y , 10th/11th/12th grades) Foreign Language (I, II or III) (2y, 10th/11th grades) Philosophy (2y, 10th/11th grades) Physical Education (3y, 10th/11th/12th grades)	
Specific subjects	Common core	One triennial (3y, 10th/11th/12th grades) Two biennial (2y, 10th/11th grades)
	Specific subjects	Two annual (1y, 12th grade)

- 9 subjects per track (where 4 had national exams in the past)
- Tracks: Arts, Languages and Humanities, Socioeconomics, Science and Technology
- High school GPA was an unweighted average of all subjects at high school
- (after the revision, it will be now weighted by the duration of the subject)

Motivation (cont.)

Research Question

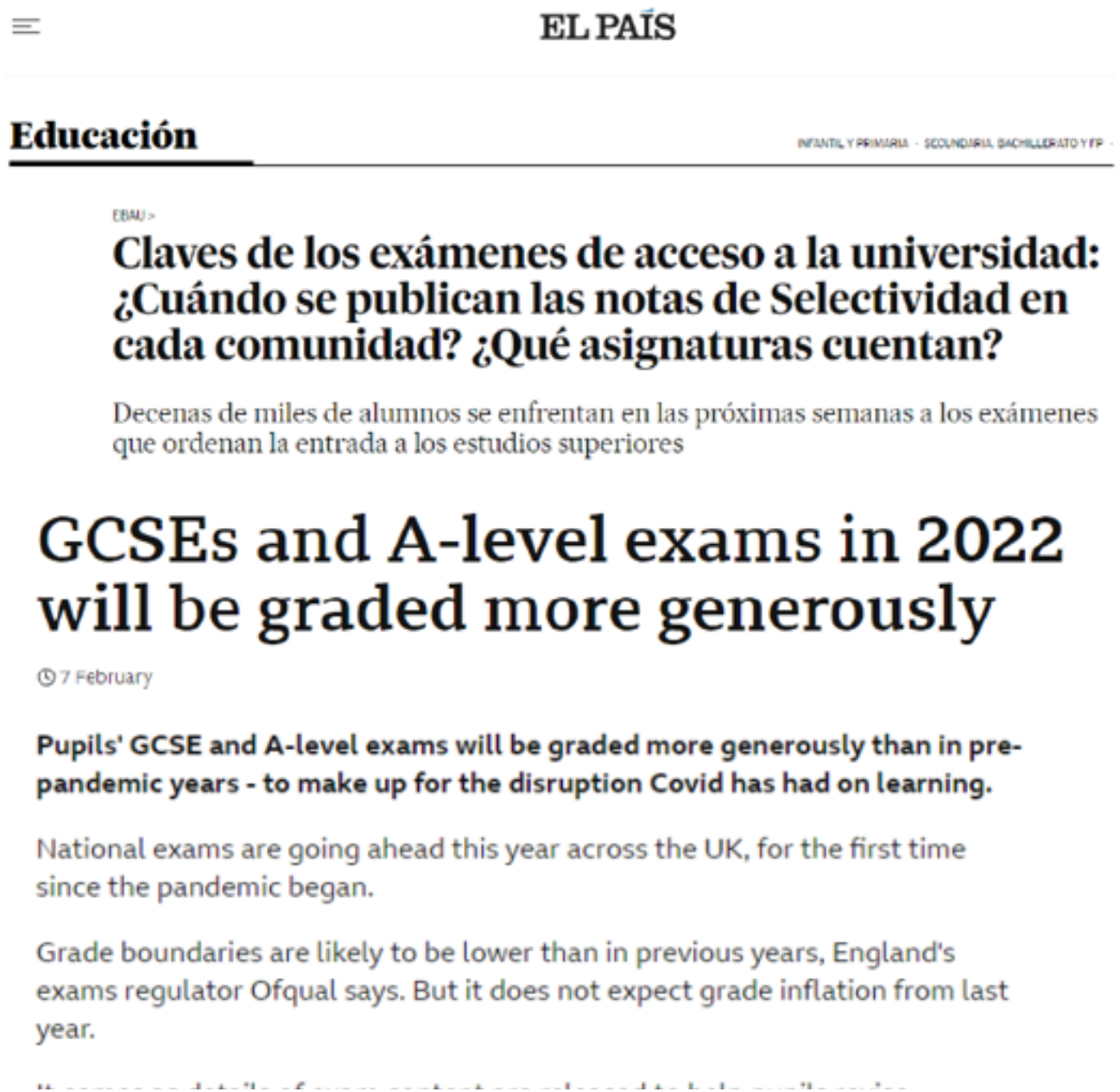
How teacher grades in secondary education differ in the presence of high-stake assessments (national exams)?

Systematic differences:

- over time (dynamic grade inflation)
- high school type (public/private) (differential grade inflation)
- high school course
- SES (level ASE)
- region
- type of HE degree

Why is this relevant?

Why is this relevant?



EL PAÍS

Educación

INFANTIL Y PRIMARIA · SECUNDARIA, BACHILLERATO Y FP ·

EBAU >

Claves de los exámenes de acceso a la universidad: ¿Cuándo se publican las notas de Selectividad en cada comunidad? ¿Qué asignaturas cuentan?

Decenas de miles de alumnos se enfrentan en las próximas semanas a los exámenes que ordenan la entrada a los estudios superiores

GCSEs and A-level exams in 2022 will be graded more generously

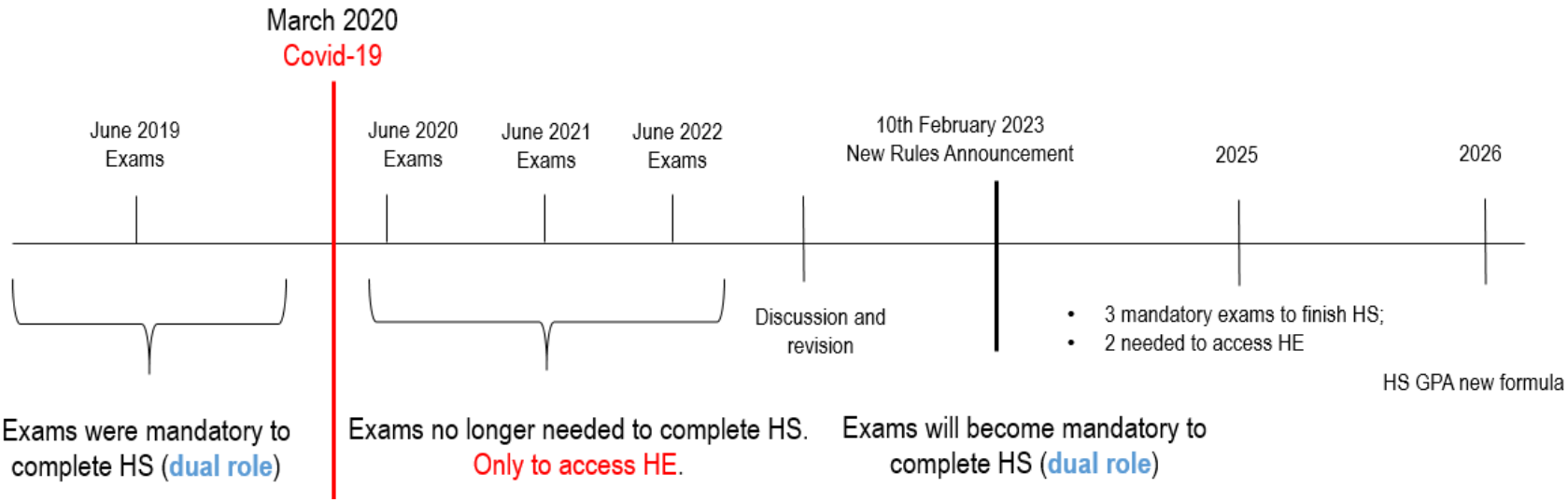
7 February

Pupils' GCSE and A-level exams will be graded more generously than in pre-pandemic years - to make up for the disruption Covid has had on learning.

National exams are going ahead this year across the UK, for the first time since the pandemic began.

Grade boundaries are likely to be lower than in previous years, England's exams regulator Ofqual says. But it does not expect grade inflation from last year.

Why is this relevant?



- After Covid-19, national exams not needed to finish HS (completion rate increased "artificially"), only to access HE
- June 2022 - Feb 2023: Revision of the access regime to HE
- Feb 2023: announcement of the return of mandatory national exams to finish HS
- Set 2025 - secondary students will have to succeed in 3 exams to complete HS and new applicants to HE will have to be ranked in at least 2 of them.



EXAMES NACIONAIS

Portugal será um dos poucos países europeus sem exames de conclusão do secundário

Provas de fim de ciclo servem também para ordenar candidatos ao ensino superior na maioria dos sistemas de ensino europeus, tal como acontece em Portugal desde os anos 1990.

Samuel Silva
6 de Janeiro de 2023, 6:49

O que significa acabar com os exames

Portugal pode passar a ser um dos países com menos dados para avaliar o que está a fazer com os seus alunos.

Não matem os exames nacionais

É evidente que os exames nacionais refletem as desigualdades do sistema de ensino. Só que essa é uma excelente razão para os mantermos e não para os abandonarmos.

Andreia Sanches
2 de Fevereiro de 2023, 5:30

Receber alertas

Susana Peralta
3 de Fevereiro de 2023, 6:35

Receber alertas

Source: *Público*

Newspaper titles in Jan/Feb 2023:

- "Portugal will be one of the few European countries without secondary school leaving exams"
- "What does it mean to end (national) exams?"
- "Do not kill the national exams"

Motivation (cont.)

Pressure for high (teacher) grades is an issue

- **Biases choice** of subjects by students, where they can easily obtain higher grades (Chowdhury, 2018)
- **Skill acquisition**: student learning and lenient grading may be negatively related (Johnson, 2003)
- Grades loose **signalling power**: students overestimate their chances of accessing HE and being successful (Gershenson, 2018)
- Not able to **distinguish students** at the top of the distribution.
- **Low effort** (DeFraja & Landeras, 2006), especially by high achieving students (Lackey & Lackey, 2006; Pressman, 2007).
- Difficult to determine **how effective the school** is in imparting knowledge and developing student skills

Motivation (cont.)

Grade inflation definition (Tyner and Gershenson, 2020)

Grade inflation in high school is a complex issue with significant implications for competition, access to higher education, and the credibility of academic standards (Silva et al. 2024).

- Static grade inflation
- **Dynamic grade inflation**
  - increase in grades over time that does not correspond to gains in student achievement or academic attainment (Eiszler, 2002; Kostal et al., 2016; Rosovsky Hartley, 2002) that may result in "the deterioration of the external validity of grades given to students" (Oleinik, 2009, p. 157)
- **Differential grade inflation**
  - occurs when the relationship between grades and actual achievement varies by school type or student background (Burgess and Greaves, 2013)

Can we learn something from the data?

Let's compare the period in which national exams were optional with the period in which they were mandatory

Outline

- Institutional setting
- Data
- Results
- Conclusions
- Policy implications

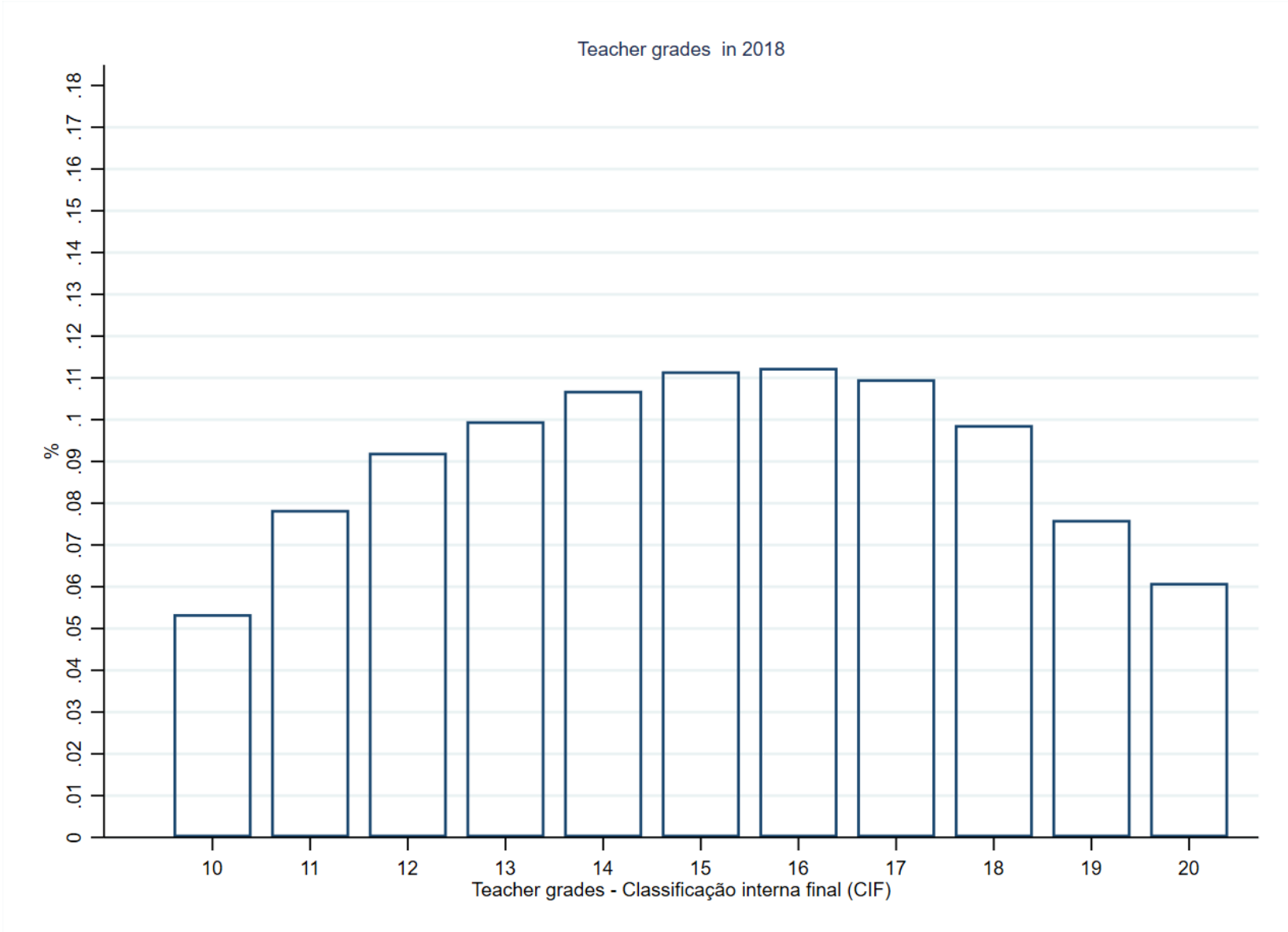
Data

- National Secondary Exams Dataset (ENES) - 2017 to 2023
- Since 2017 that reports all subjects taken at high school
- Population data on general upper secondary education leavers
- Analysis restrictions:
  - 2017-2022
  - 1.56% for which it is not possible to identify the school in 2022
  - Consider all approved subjects in high school (CIF $>= 10$)
  - Consider the school where the student took the exams as a proxy for the region
  - Exclude the subject of EMR

What is the behaviour of teacher grades when comparing high school grades and national exams?

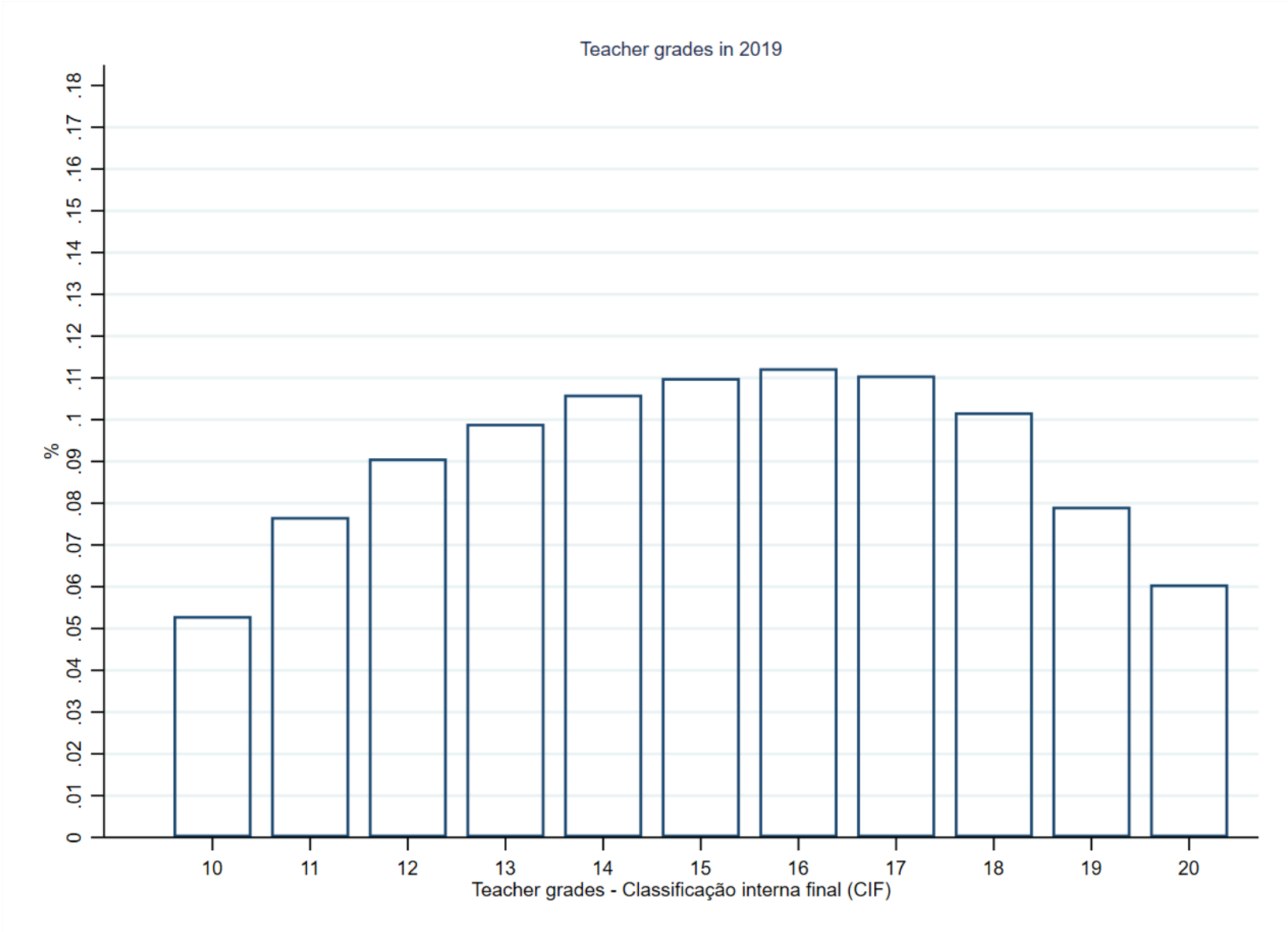
(Dynamic grade inflation)

Results: distribution of teacher grades



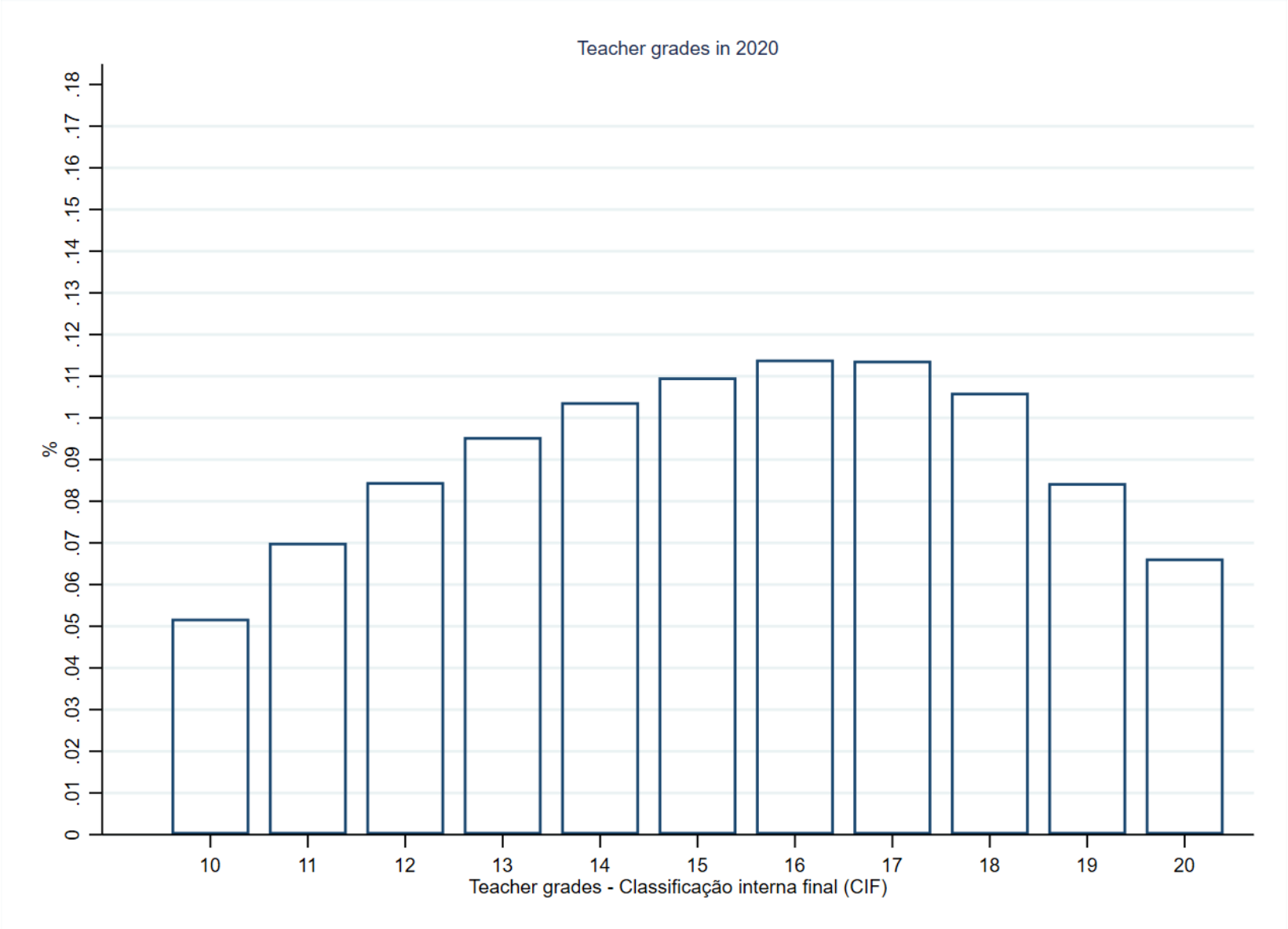
Source: ENES (JNE via DGEEC)

Results: distribution of teacher grades



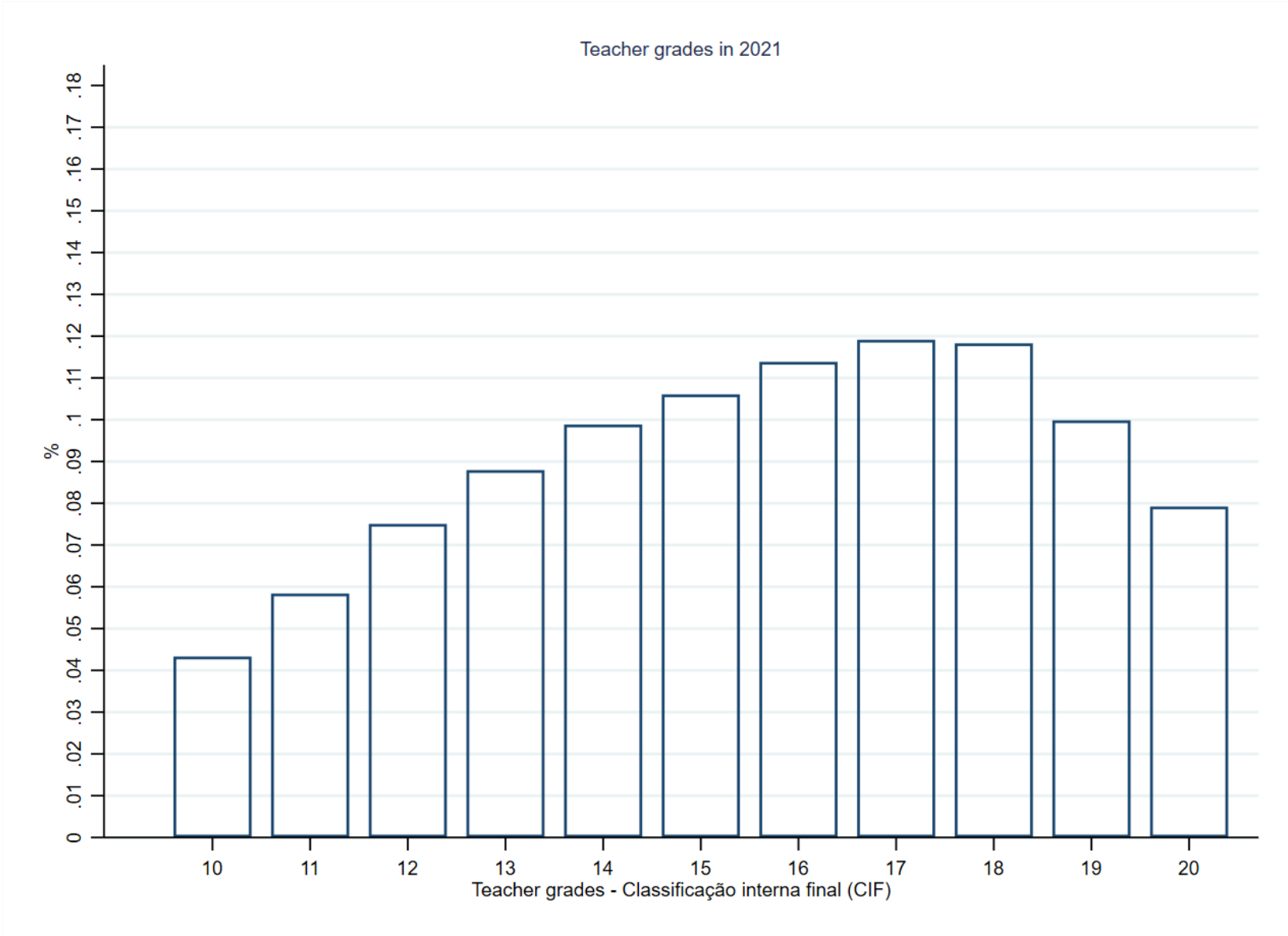
Source: ENES (JNE via DGEEC)

Results: distribution of teacher grades



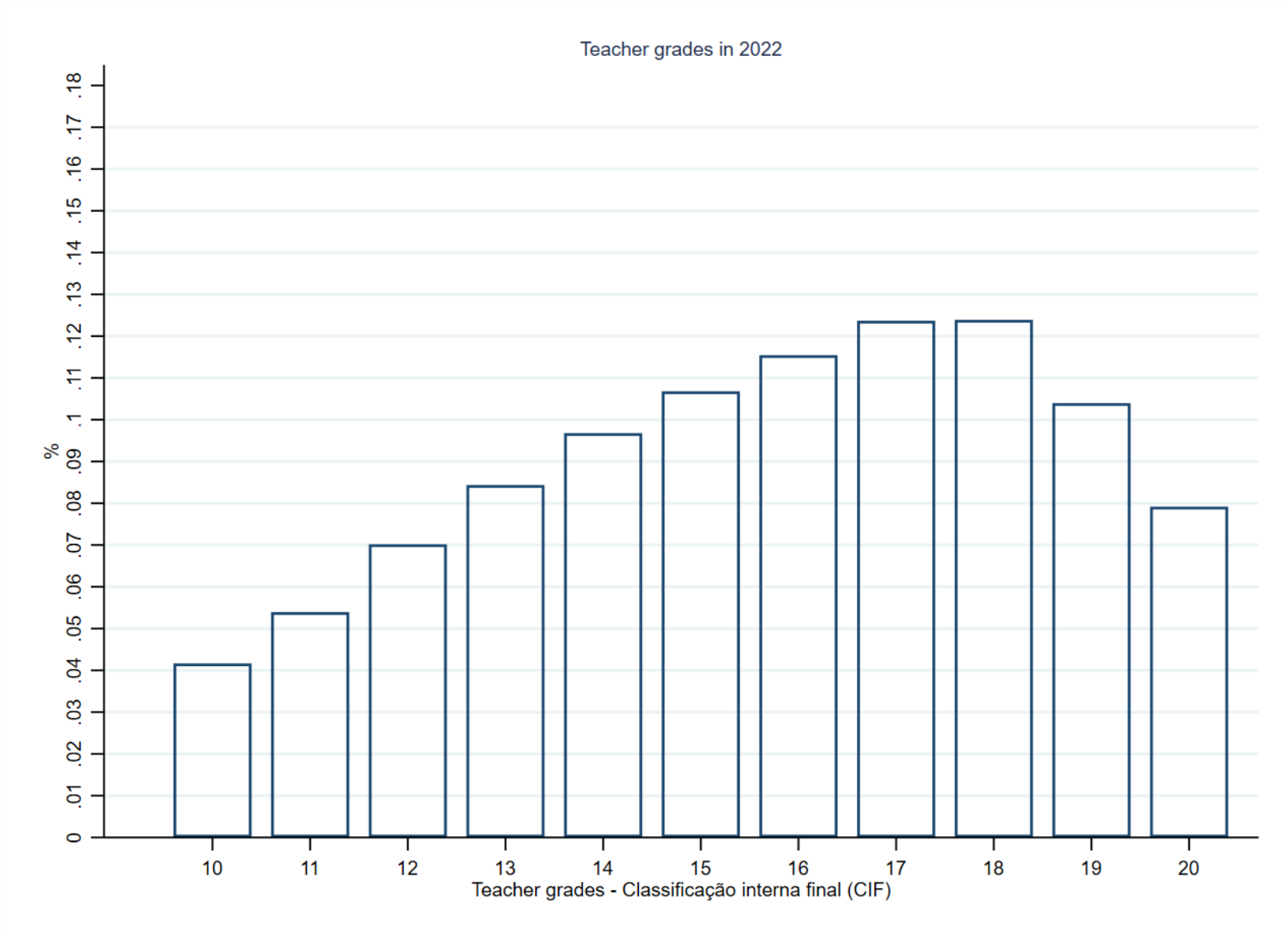
Source: ENES (JNE via DGEEC)

Results: distribution of teacher grades



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Results: distribution of teacher grades



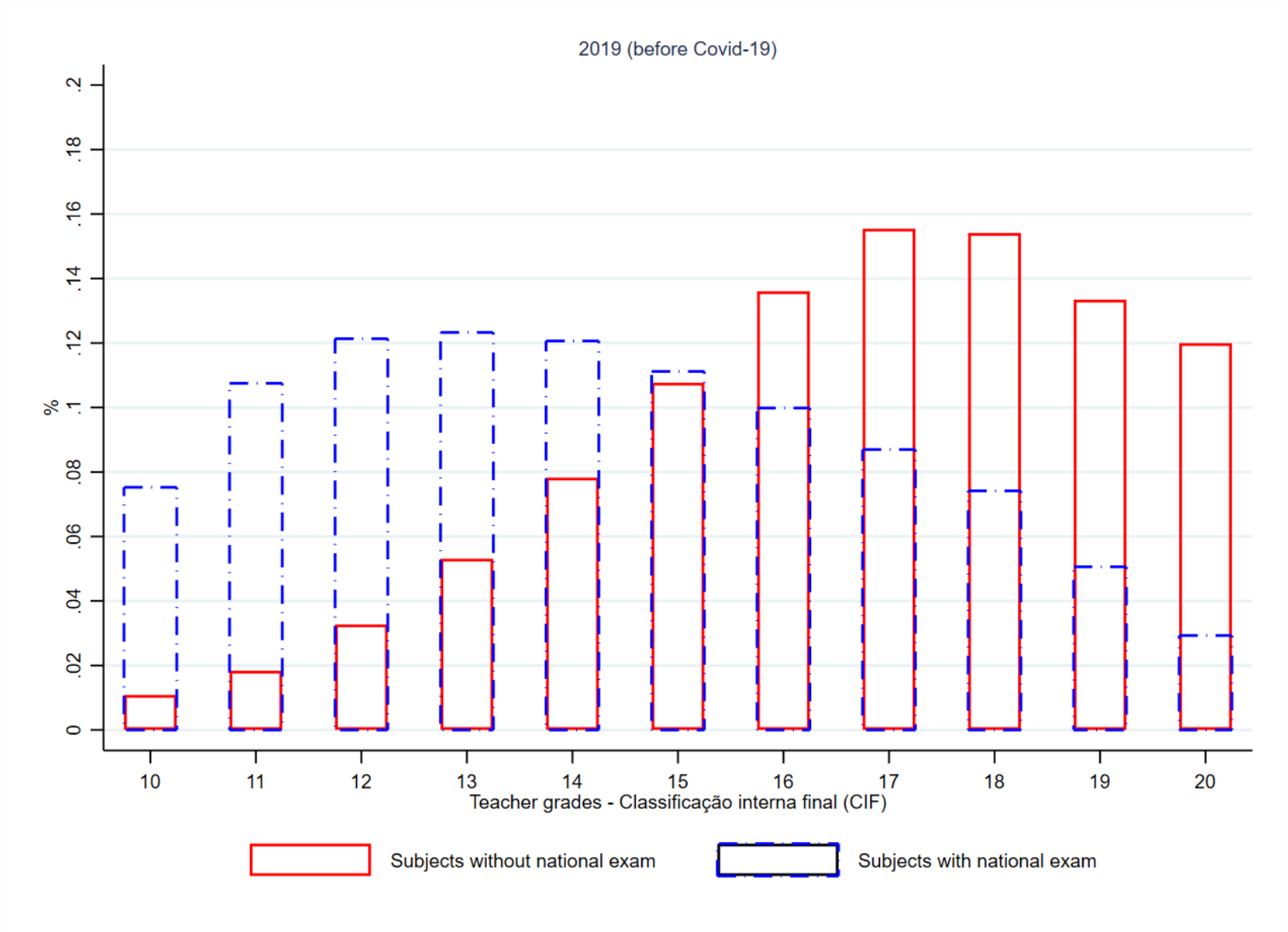
Source: ENES (JNE via DGEEC)

Is this trend common to all disciplines?

Subjects without associated national exam:
Annual subjects (12th grade) + Physical Education

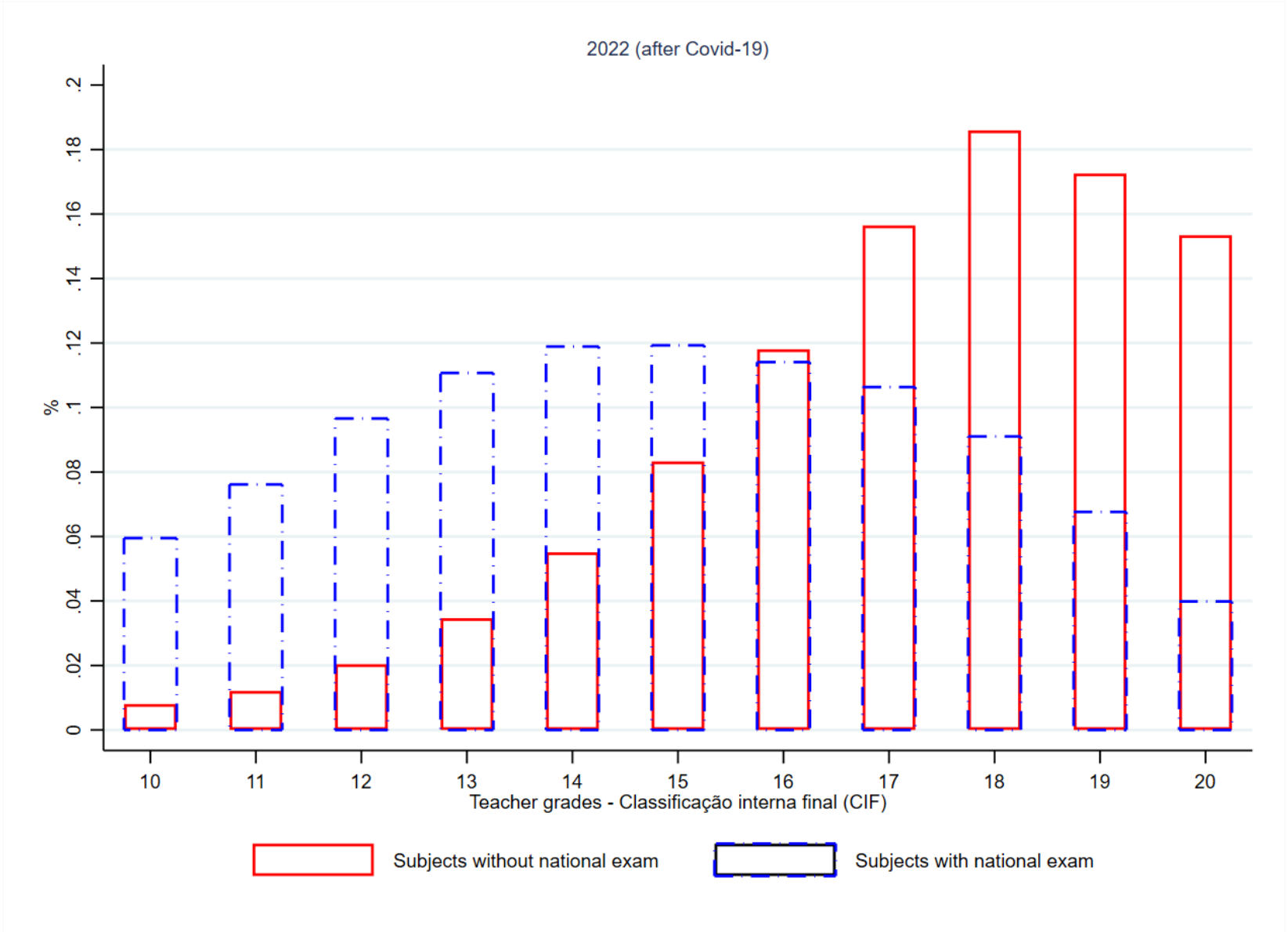
Subjects with associated national exam:
Triennials and Biennials (exams taken in the 11th and 12th grades)

Subjects with and without associated national exam



Source: ENES (JNE via DGEEC)

Subjects with and without an associated national exam



Source: ENES (JNE via DGEEC)

Subjects with and without associated national exam

Year	No. student-subjects	Mean score	Mode score	% scores		
				15-17	18+	15+
Subjects without national exam						
2018	165050	16,6	17	39,8	40,5	80,2
2019	165186	16,6	17	39,9	40,8	80,7
2020	162882	16,9	18	39,1	44,4	83,5
2021	168410	17,2	18	35,9	51,9	87,8
2022	169843	17,2	18	35,8	51,2	87,0
Subjects with national exam						
2018	316466	14,3	13	30,0	14,8	44,8
2019	313316	14,3	13	29,8	15,4	45,2
2020	329764	14,4	13	31,1	16,4	47,6
2021	328535	14,7	14	32,9	18,4	51,2
2022	320289	14,8	15	34,0	19,8	53,8

Source: ENES (JNE via DGEEC)

- Teacher grades increased over time (on average);
- Growing concentration in the highest classifications;
- Very marked differences in the distribution if grades according to the subjects (namely if with or without national exam)

Subject and high school types

(Differential grade inflation)

Subjects with and without associated national exam

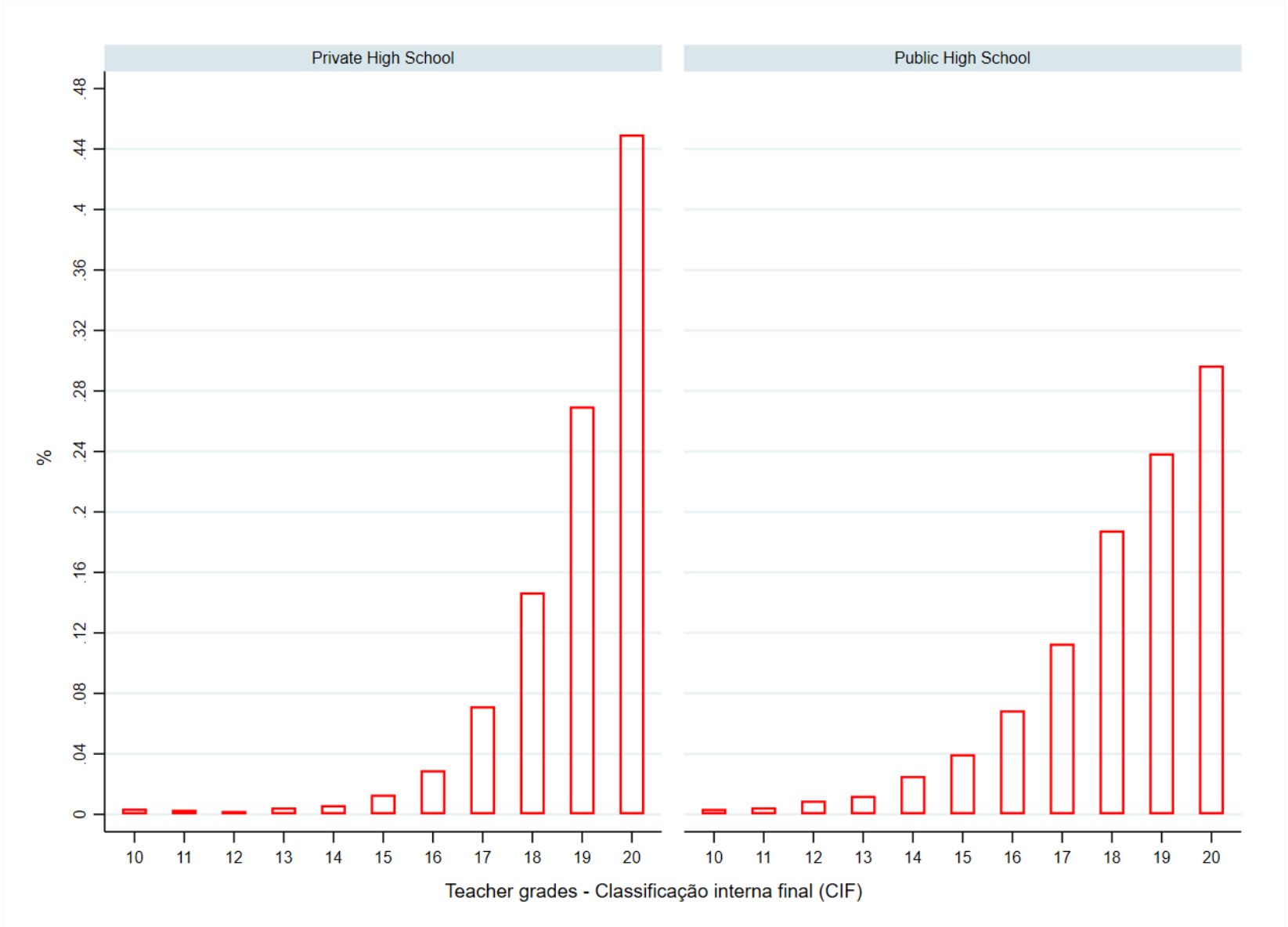
Subjects with national exam	subjects without national exam (12th)
Biology and Geology (10/11th)	Biology Geology
Physics and Chemistry A (10/11th)	Physics Chemistry
Economics A (10/11th)	Economics C
Geography A (10/11th)	Geography C
History B (10/11th)	
History of Culture and Arts (10/11th)	
Philosophy (10/11th)	
Applied Maths (10/11th)	
Descriptive Geometry A (10/11th)	
Foreign Language I/II/II	Foreign Language I/II/II
Draw A (10/11/12th)	
History A (10/11/12th)	
Maths A (10/11/12th)	
Portuguese (10/11/12th)	
	Latin A Arts
	Portuguese Literature
	Law Informatics
	Psychology Sociology
	Sports (10/11/12th)

E.g. Physics and Chemistry vs Physics/Chemistry

Year	Public High School					Private High School				
	No.	Mean	Mode	% scores		No.	Mean	Mode	% scores	
				15-17	18+				15-17	18+
Physics and Chemistry A (10 and 11th grades, with national exam)										
2018	6121	14,0	12	27,6	13,8	1067	15,2	16	31,7	26,6
2019	6073	14,0	12	27,4	13,8	981	15,4	18	31,7	28,7
2020	6528	14,1	11	28,2	14,4	1048	15,2	18	32,2	27,1
2021	6258	14,2	14	28,9	15,4	914	15,7	17	34,9	31,2
2022	5869	14,5	14	30,9	17,8	908	15,6	17	34,2	29,8
Physics (12th grade, without national exam)										
2018	1349	16,8	20	31,9	47,9	303	17,9	20	23,4	65,5
2019	1404	16,7	20	31,2	47,4	250	17,9	20	24,1	65,6
2020	1365	17,0	20	29,9	50,8	267	18,1	20	22,0	70,2
2021	1491	16,9	20	28,9	50,8	294	18,0	20	20,6	69,1
2022	1254	16,9	20	29,5	50,5	237	17,8	20	22,9	66,6
Chemistry (12th grade, without national exam)										
2018	1318	17,6	20	30,2	59,1	307	18,1	20	22,1	69,1
2019	1276	17,5	20	31,6	57,9	254	18,3	20	22,0	72,1
2020	1077	17,7	20	29,7	62,2	177	18,6	20	17,7	78,0
2021	1210	17,7	20	28,4	62,4	181	18,6	20	18,3	79,0
2022	1070	17,6	20	28,5	60,7	195	18,4	20	20,4	74,9

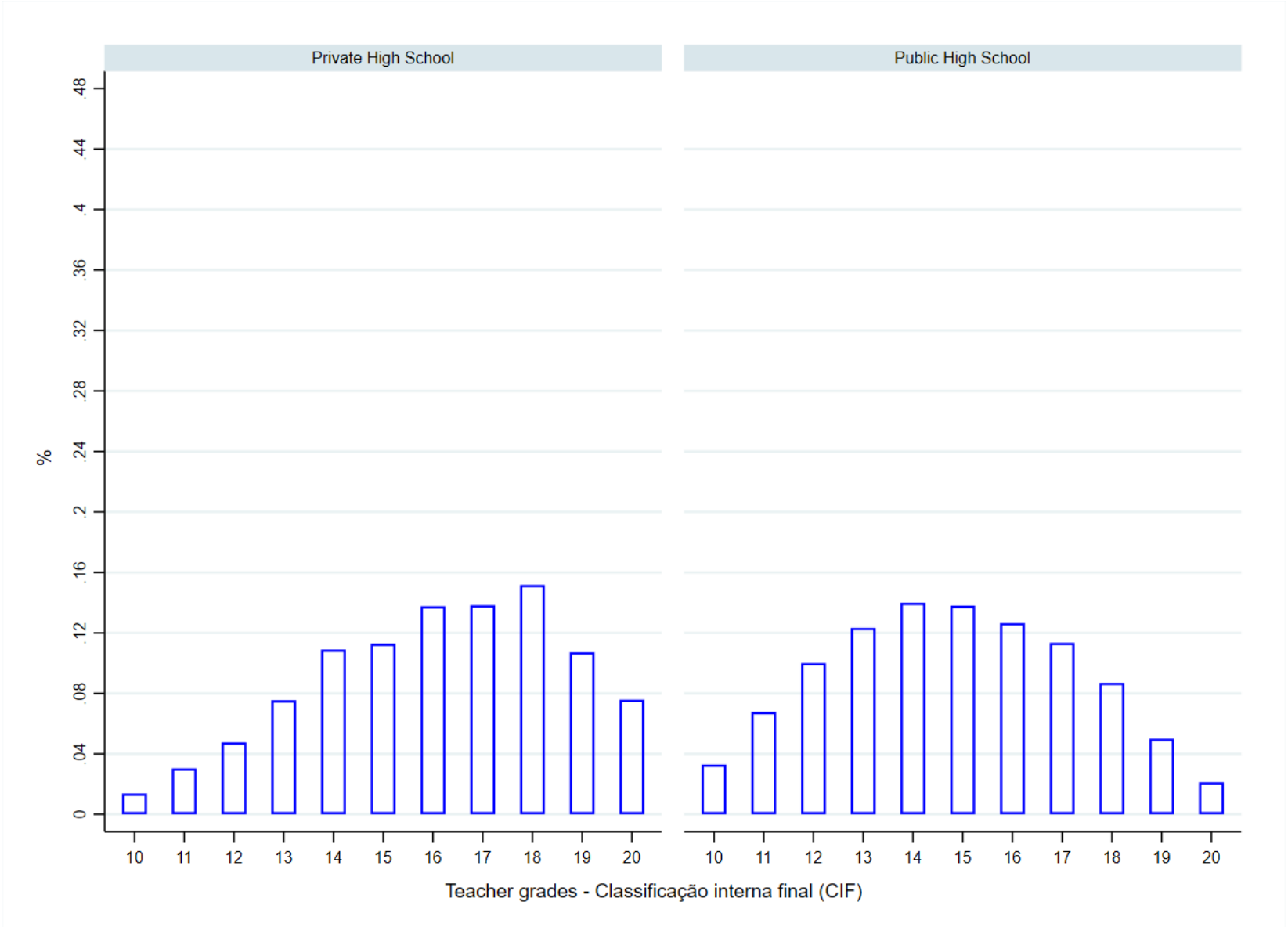
Source: ENES (JNE via DGEEC)

Informatics B (12th grade) in 2022 (Aplicações Informáticas B)



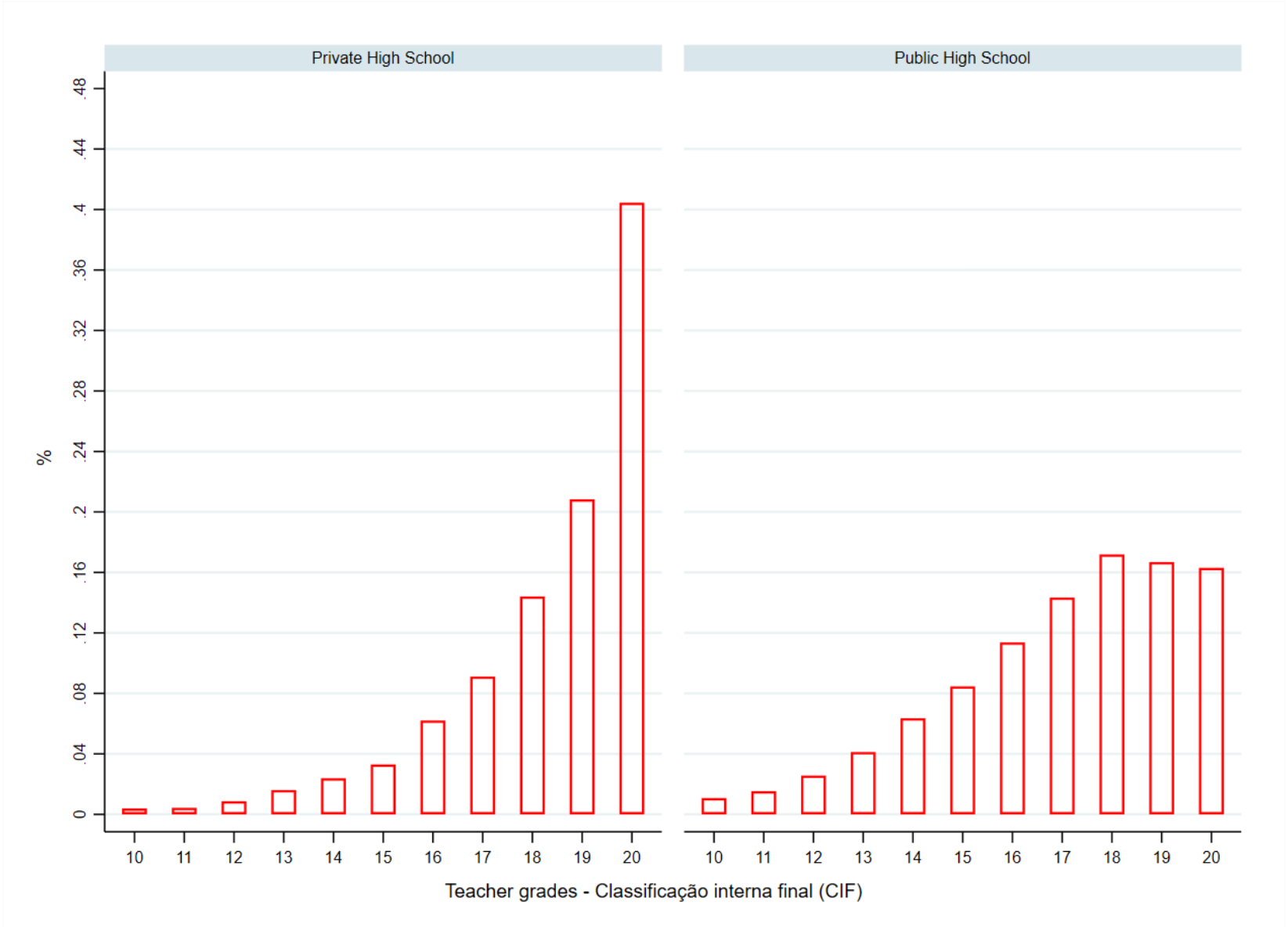
Source: ENES (JNE via DGEEC)

Biology and Geology in 2022 (with national exam associated)



Source: ENES (JNE via DGEEC)

Biology in 2022 (without national exam)



Source: ENES (JNE via DGEEC)

Region

Subject without national exam by district (Portugal mainland in 2022)

Year	Public High School					Private High School				
	No. stu.-subjects	Mean	Mode	% scores 15-17	% scores 18+	No. stu-subjects	Mean	Mode	% scores 15-17	% scores 18+
Aveiro	9955	17,4	18	34,8	55,5	717	17,9	20	26,6	65,6
Beja	1672	16,9	18	44,7	43,3	72	18,1	18	22,2	75,0
Braga	13447	17,6	18	33,0	59,7	1449	18,8	20	13,1	85,0
Bragança	1500	17,5	18	31,7	57,9					
C. Branco	2579	17,6	19	34,3	58,0					
Coimbra	6002	17,2	18	38,0	50,8	479	18,7	20	13,2	83,3
Évora	2688	16,5	18	45,9	36,6	82	18,2	20	23,2	70,7
Faro	6211	16,6	17	43,9	38,7	99	18,1	19	23,2	71,7
Guarda	2017	17,2	17	39,1	48,6					
Leiria	6536	16,7	18	43,7	41,2	379	17,4	18	37,7	54,9
Lisboa	32343	16,5	18	41,7	38,2	7266	17,8	19	29,4	64,4
Portalegre	1424	16,9	18	37,7	46,6					
Porto	23097	17,6	20	31,8	58,8	5989	19,0	20	9,5	88,1
Santarém	6768	17,1	18	37,5	49,7	413	17,3	18	35,6	53,8
Setúbal	12491	16,5	18	42,4	38,3	946	17,7	19	30,7	63,1
V. Castelo	3558	18,0	19	27,8	67,7	110	19,4	20	3,6	96,4
Vila Real	3266	17,7	19	30,6	62,1					
Viseu	5685	17,5	18	32,3	58,3	33	18,2	19	24,2	72,7

Porto district

Year	Public High School					Private High School				
	No. stud.-subjects	Mean	Mode	% scores 15-17	% scores 18+	No. stud. subjects	Mean	Mode	% scores 15-17	% scores 18+
	Subjects with national exam									
2018	45302	14,4	13	30,6	15,7	12250	16,2	20	29,3	40,4
2019	44000	14,4	13	29,5	16,4	12715	16,4	20	30,9	41,9
2020	44782	14,6	14	31,2	18,2	12348	16,4	20	31,2	42,1
2021	45199	14,8	14	32,8	19,8	11304	16,9	20	31,6	47,9
2022	38626	15,1	15	34,6	22,5	10588	16,8	20	30,5	48,1
	Subjects without national exam									
2018	23966	17,1	18	38,3	47,6	6195	18,7	20	15,3	80,5
2019	23443	17,0	18	39,4	46,1	5933	18,7	20	15,1	80,5
2020	23011	17,4	20	36,5	53,3	6240	18,8	20	13,6	82,8
2021	22905	17,6	20	31,7	59,8	5873	19,1	20	9,4	88,5
2022	23097	17,6	20	31,8	58,8	5989	19,0	20	9,5	88,1

Source: ENES (JNE via DGEEC)

- In all regions (not specific to one region)
- Porto is the district where we observe the highest concentration of grades on the top of the distribution
- The values are higher in the North (Porto, Braga, Viana do Castelo, Guarda, Castelo Branco) compared to the South (Lisboa, Setúbal, Beja e Faro)

SES (ASE)

Socioeconomic status (ASE) from 2018-2022

ASE	Subjects with national exam					Subjects without national exam				
	No. stud.-subjects	Mean	Mode	% scores 15-17	% scores 18+	No. stud. subjects	Mean	Mode	% scores 15-17	% scores 18+
	By level ASE									
Non	1326217	14,6	14	31,6	17,9	685868	16,9	14	37,5	46,4
C	24536	14,5	14	34,2	15,3	9138	17,3	18	37,0	52,3
B	153101	14,3	13	32,0	12,8	79813	16,9	18	40,4	44,7
A	104516	14,0	13	29,3	11,1	56552	16,6	17	41,8	39,1

Source: ENES (JNE via DGEEC)

- 3 levels of ASE: C (not entitled to monetary benefits, only a laptop), B, and A
- Grades at the top of the distribution (i.e., CIF +18) is always higher in the group of non-beneficiary/C.
- The percentage of classifications at the top of the distribution is lower when the subjects considered are those with an associated exam (and not subjects without associated national exams).

Final remarks

- A growing concentration of students in the highest classifications
- Very marked differences in the distribution of teacher grades between subjects with and without an associated national exam in all years
  - Subjects without national exams: 87% grades above 15 (2022)
  - Subject with national exams: 54% grades above 15 (2022)
  - True for both public and private schools, and all high school courses
- The **modal classification** in the distribution of internal classifications of **subjects without** a national exam is **often 20** values
- Relevant indications that there was **grade inflation in the period analysed**

Obrigado!

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