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Learning Quality in Math and Science in Primary in Spain and France

Lessons from TIMSS 2023

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EXECUTIVE SUMMARY

In the verge of a new technological revolution, Math and Science skills will gain its importance as critical skills for social and economic progress. Why some countries are better than others in teaching such skills? Recent results of the international assessment TIMSS 2023 displayed poor results for both Spain and France in Math and Science grade-4 exams compared with OECD countries participating in TIMSS. Moreover, results worsened in both countries relative to the previous edition of 2019.

This policy brief studies such gap through a close examination of the latest TIMSS micro-data, just released in February 2025. It addresses the evolution of key social factors that influence student learning and constructs a novel "Learning Quality Index" (LQI) that measures the net contribution of education systems to learning after discounting the social, economic, and cultural context of students and families, as well as the expectations and value they place into education. It also attempts to identify the causes of between country variation in such index We find that:

1. LQI results show high cross-country correlation between TIMSS and PISA in Secondary and between TIMSS results in Primary and Secondary, revealing that what TIMSS captures in Primary is relevant as predictor of quality of education systems.
2. Both Spain and, especially, France, perform significantly below OECD average in Math and Science in LQI. According to our estimates, such gap implies an economic loss of 44 billion in France and 7 billion euros in Spain to each cohort that goes into Primary school.
3. LQI in Primary has not varied much since 2019 and contrasts with a positive LQI in Secondary school, according to both TIMSS and PISA data. LQI is worse for socially favored students, revealing a pro-equity approach and a system in which skills development at the top of the social ladder does not seem to matter.
4. The recent decline in TIMSS 2023 performance since 2019 for Primary can be largely attributed to worsening social conditions of children. state that they arrive at school hungry, with a 50% increase in Spain and 55% in France, with almost half of French fourth graders now reporting feeling hungry every day or almost every day. Moreover, the gap between language at home and language of instruction rose, especially in Spain, a country in which 32.1% of Primary students never or sometimes speak the language of instruction.
5. Exploring education policy factors that may explain such learning quality gap, data shows that: (i) teacher academic skills of both Primary and Secondary teachers are not an issue, with the exception of Primary teachers in Spain; (ii) classroom learning climate is near

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OECD average, but worsened in many countries, especially in Spain; (iii) Spain does well in school social indicators like sense of belonging and bullying, while France performs worse, in a context of global decline; (iv) uneven application of instruction time rules could be explaining part of the "learning quality" gap.

To address the learning quality gap observed for both countries, which clearly share historical similarities regarding education policy, four recommendations are made:

a) Improve the learning conditions at school to respond to the social impoverishment of students, including breakfast and food programmes, investing in more psycho-social support to children, considering additional policies to ensure the effectiveness of language of instruction policies, and developing further social programmes to improve living conditions of children.

b) Elevate the learning expectations of students and the academic skills of teachers and simplify curricula by creating a more streamlined curriculum with unambiguous learning goals and ready-to-use teaching examples.

c) Upgrade and promote effective in-service training, providing large-scale, practical teacher training focused on foundational instruction and classroom management in diverse settings, emphasizing both academic rigor and socioemotional support.

d) Invest in effective early remedial support by prioritize small group tutoring and radically applied targeted resources in Primary schools to tackle emerging skill gaps quickly, so no student is left behind before entering Secondary education.

1. Introduction: learning continues to recede in Primary

The 2023 TIMSS survey micro-data was released on early February 2025, allowing to shed new light on education quality at the Primary level in the post Covid-19 era. Scores of pupils in mathematics and science represent their level of knowledge and competencies in both subjects. This TIMSS round is relevant, as it is the first international assessment in Math and Science for Primary students conducted after the pandemic of Covid-19. Meta-analysis of the impact of Covid-19 and subsequent school closures displayed a larger learning loss in math compared to reading (Betthäuser et al, 2023), hence pointing to mathematics as the weak spot of education systems in the post-pandemic times.

Like in the previous rounds, average scores in 4th grade for Spain and France look disappointing especially when compared with OECD countries participating in TIMSS. Spanish pupils in grade 4 score about 30 points below OECD participants' average, which represents more than half a year of schooling. French pupils are the least proficient students in the OECD, and by far, scoring 50 points below the OECD average, the equivalent of a whole year of schooling. These results in math and science are clearly worse than in reading, which was last measured by the PIRLS assessment in 2021 for 4th grade students: although both Spain and France Primary pupils fared also below the OECD average in reading, their gap with other developed countries was smaller, around 10 to 15 points.

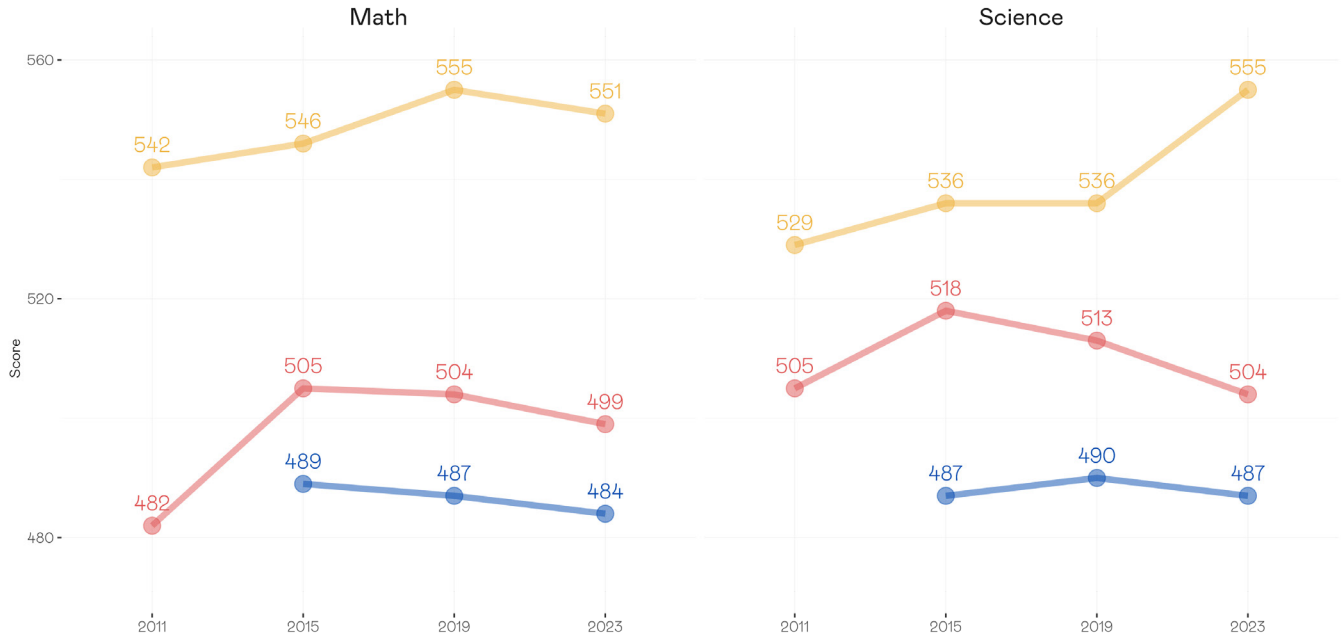
In this brief, we present a novel and in-depth analysis of the recent evolution of the quality of education systems in Spain and France in Primary grades. Spain and France share important similarities in their education systems and a joint analysis can shed light on common challenges both countries are facing. We do so by conducting an in-depth data analysis of TIMSS 2019 and 2023 recently released micro-data: while TIMSS 2023 results were released in December 2024, micro-data was not available for open download until February 2025. Drawing from extensive previous experience of analyzing education systems with international assessments, we conduct a thorough analysis tracking key factors and enablers of student academic progress and draw on statistical and econometric advanced techniques to identify what social and policy factors can help us understand what may be happening among Spain and France's Primary student. To our knowledge, this is one of the first in-depth country study produced with TIMSS 2023 data for Spain and France.

Scores in Primary have been sliding in Math and Science in both Spain and France since 2015. In Figure 1, French pupils lost about 3 points in both Math and Science while Spanish pupils lost about 5 points in Math and 9 points in Science between 2019 and 2023. This evolution is concerning since Math competencies are foundational skills that have an increasingly stronger impact on all remaining learning opportunities during schooling and beyond. Although just the drop in science for Spanish pupils is statistically significant, this occurred in a context in which 35% of countries experienced a decline in math and science in Primary grades, 25% others stayed the same but 40% of countries improved their scores. Using this as a case example in this report,

scores of Primary pupils have been increasing fast between 2003 and 2023 in England. Owing to pedagogical reforms, English pupils have gained 21 points in math and 16 points in science, which represents half a year of schooling. English students also gained 19 points in reading between 2016 and 2021, as measured by the PIRLS international assessment.

Results have been also published at grade 8, but only France participated in the 2023 round. French pupils are also scoring well below OECD countries. However, the gap at this level is twice as small. This is evidence that although French pupils leave Primary schools with massive skills shortages, they can catch up to same extent at the lower Secondary level. In 2023, the scores of French pupils at grade 8 did stabilize compared to the previous wave in 2019.

Figure 1 - **Evolution of average TIMSS scores in mathematics and science at grade 4 in Spain, France and England**



Source: Computations from TIMSS 2011, 2015, 2019 and 2023 microdata. | EsadeEcPol

Spain and France education systems do catch up academically in Secondary, although in Spain this occurs at a high cost regarding higher repetition and dropout. Spain and France had very similar results in PISA 2022, which assessed the skills of 15-year-olds, around grade 10[1]. France and Spain Secondary students are only about 20 points in reading behind the OECD countries which participated in TIMSS, 4 points in math and about 12 to 15 points in science[2]. Since Primary pupils are well behind their OECD counterparts taking TIMSS, this shows that they progress much faster at the Secondary level than in a typical OECD country. Nevertheless, while the average academic score seems to catch up with other countries, it is also true that students, especially Spain, end up paying a price of this process, as almost 30% end up repeating

1 Except for students who have repeated, which are enrolled in lower grades.
2 Not all OECD countries are participating in TIMSS at grade 4. OECD countries who participate in TIMSS tend to have higher PISA scores than the OECD full sample: OECD countries which did not participate in TIMSS 4th grade were Colombia, Costa Rica, Estonia, Finland, Greece, Iceland, Luxembourg, Mexico, New Zealand, Norway and Switzerland.

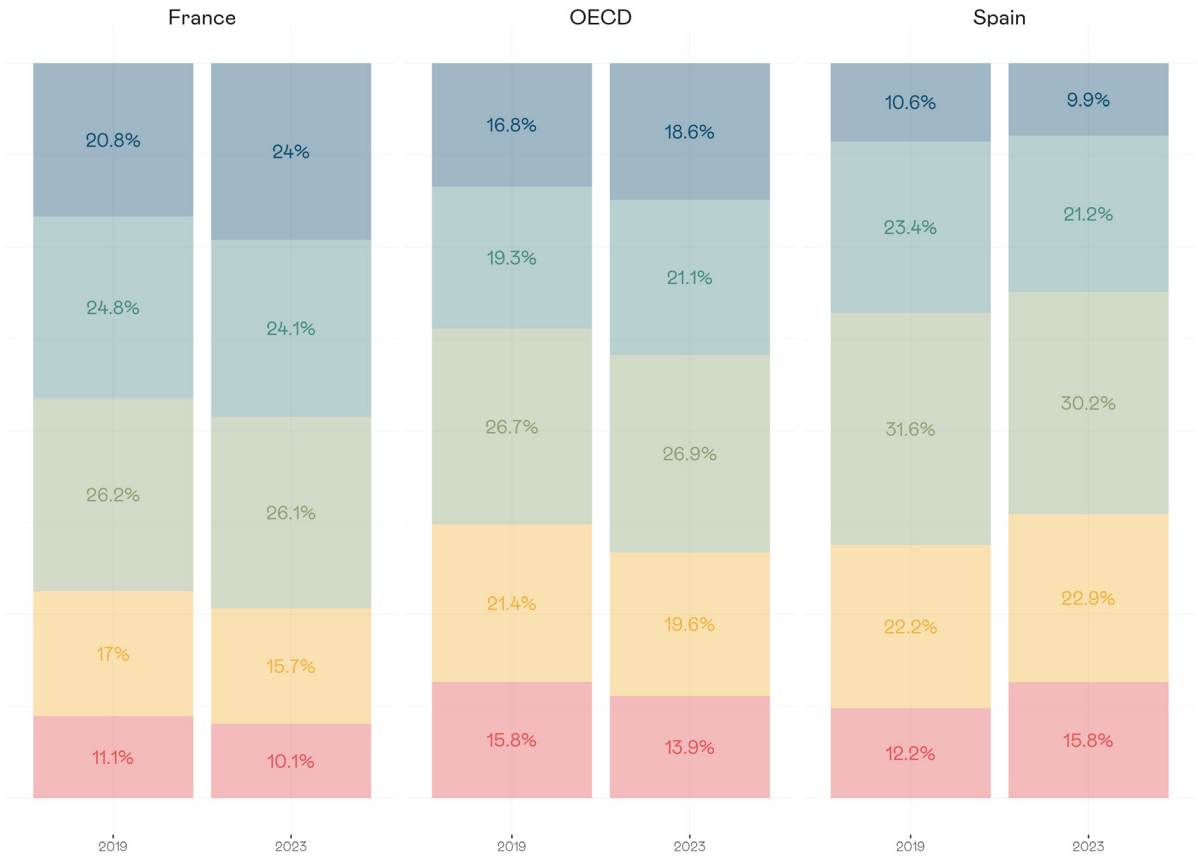
grade (and hence increase their chances of leaving the education system prematurely, the largest challenge of education in Spain), a phenomenon which is concentrated in the transition from Primary to Secondary and which disproportionately affects students from low socioeconomic backgrounds (Cobreros and Gortazar, 2023).

2. Social conditions of learners in Primary are worsening

Pupil's performance is tightly dependent of her economic, social, linguistic and cultural background. Children enjoying more favorable living conditions learn more: this is a finding widely confirmed in social and economic research on education since decades. The availability of books at home, the parent's education level, the use of the instruction language at home, the extent to which parents stimulated the children during her early years or their expectations for her future education outcomes all play a positive role on her academic outcomes. When these factors improve, children tend to progress faster at school.

One of the best predictors for academic performance is the number of children's books at home. This factor alone serves as a proxy of cultural capital at the household and explains about 22% of the variance in scores in the TIMSS survey. As can be seen on Figure 2, France is rather well equipped on that front, compared to OECD countries. In Spain however, the number of children's books is more limited, with less than 10% of pupils having more than 100 children's books, versus 23% in France. It is to be noted that the situation improved in France, between 2019 and 2023 while it rather deteriorated in Spain on this dimension.

Figure 2 - **Share of pupils according to the number of children's books at home**
0-10 | 11-25 | 25-50 | 51-100 | More than 100



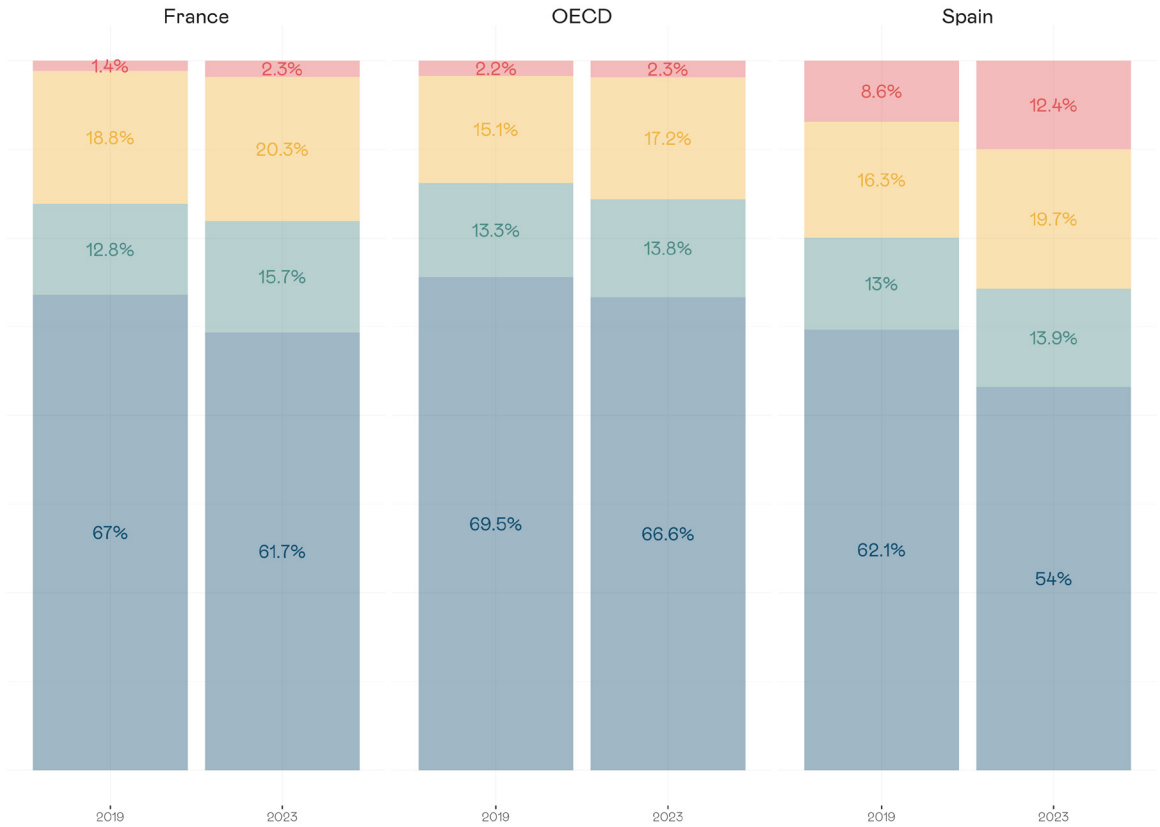
Source: TIMSS 2019 and 2023. | EsadeEcPol

A key determinant of academic performance is if children's language at home is the same from the language instruction, a phenomenon which is lower and decreasing in Spain. As of today, only a bit more than half of Primary students are now native speakers of the school language of instruction in Spain. Spain is at a disadvantage compared to France or OECD countries. While about 2% of Primary pupils in the OECD never speak the instruction language at home, this share went from 8.6% to 12.4% in Spain in 2023 (see Figure 3); adding to this those who only speak the language of instruction sometimes, the combined share of students unfamiliar with the language of instruction (never or just sometimes interacting with their own language) went from 24.9% to 32.1%, far from the 19.5% in OECD countries. This possibly occurs due to a combination of migrant population not speaking the language of instruction, the large and increasing prevalence of co-official languages as main languages of instruction since the early years in Spanish-majority speaking contexts (mostly with Catalan and Basque) or the use of English as a language of instruction since Primary (for example, in Madrid).

Figure 3 - **Evolution and comparison of the use of instruction language at home in Spain, France and OECD**

Extent to which the student speaks the same language of instruction at home

Always | Almost all the time | Sometimes | Never

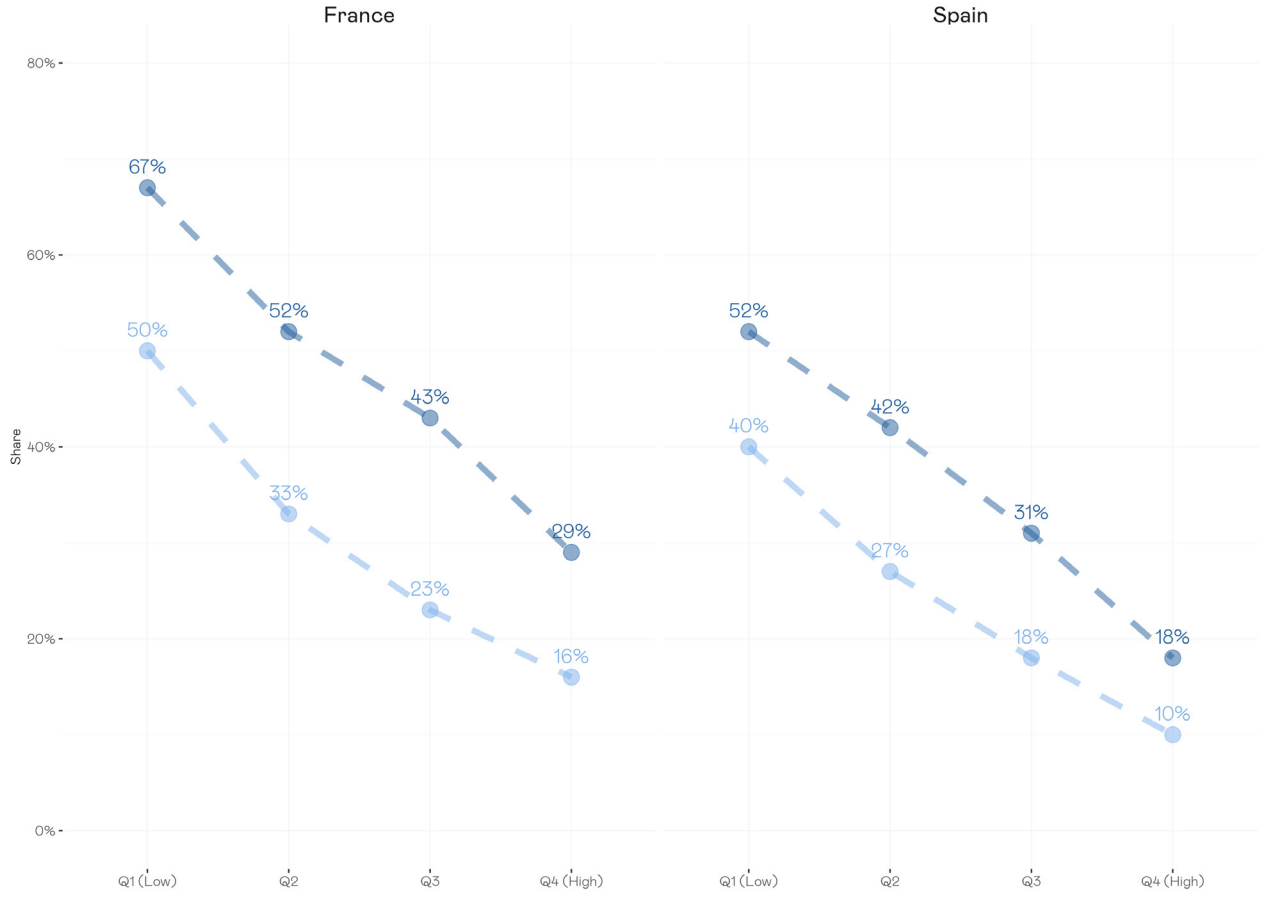


Source: TIMSS 2019 and 2023 | EsadeEcPol

A striking fact is that 4th grade children seem to declare they arrive at school hungry with higher frequency in 2023 compared to 2019. Recent causal evidence has shown the importance of appropriate diet and food habits both at home and at school, especially in early years (Bütikofer et al, 2018; Lundborg et al, 2022). Half of French children stating hunger at the time of arriving

to school every day or almost every day in 2023, which represents a 55% increase in the space of four years, see Figure 4. Similarly, and although the proportion of children stating hunger when arriving at school is lower in Spain, it also increased by 50% within the same time interval, a trend which has been tracked in household surveys[3]. Besides social impoverishment at home, in Spanish public Primary schools only 47.4% of students attend the school cafeteria daily (Educo, 2024). This is partly the result of insufficient supply and funding by regional governments but also a schooling structure organized in morning shifts, a pattern which has become more prominent in the last years in some regions (Ferrero, Gortazar and Martinez, 2022).

Figure 4 - **Share of students who say they arrive at school hungry by quartile of social conditions.** 2019 | 2023



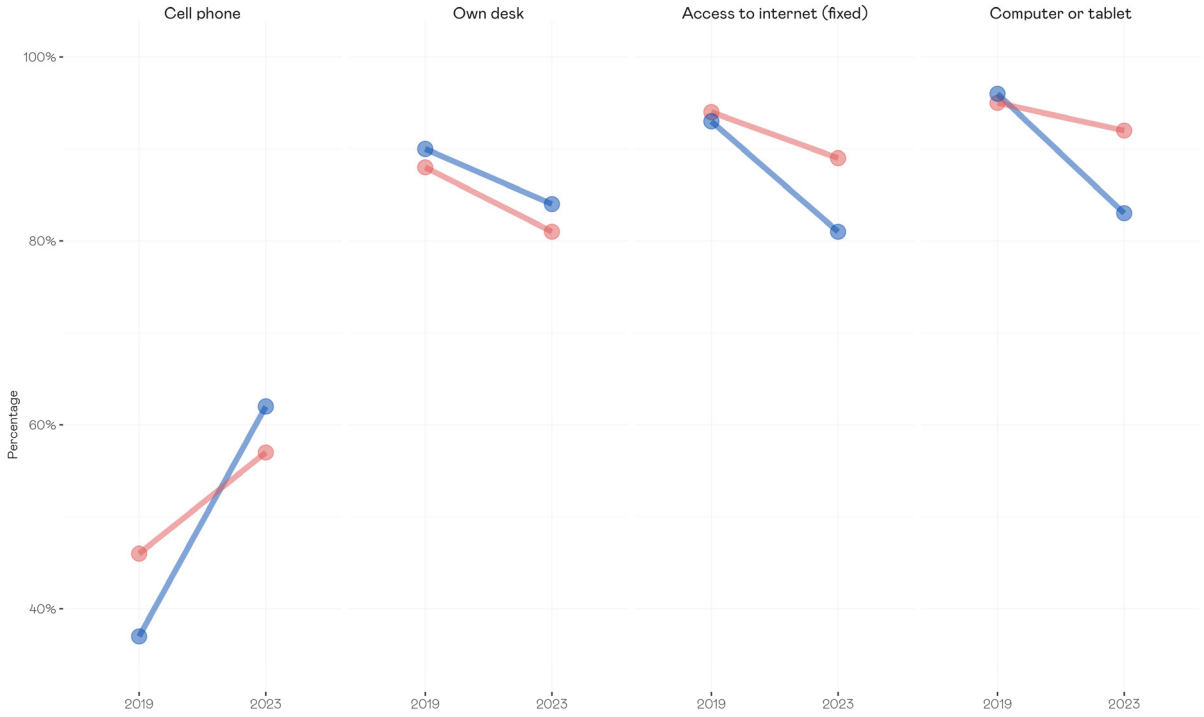
Source: TIMSS 2019 and 2023 microdata | EsadeEcPol

Moreover, goods that enhance an appropriate learning space at home are in decline, while the access to own cell phones continued its rise. Children are less likely to have a desk to study, and a computer connected to internet at home. The decrease is quite marked in France, with children without an internet access through a computer going down from 93% to 81% in four years, see Figure 5. Conversely, 4th grade children have more access to individual cell phones, with an increase of 11 percentage points in Spain and 25 percentage points in France.

3 The Encuesta de Conditiones de Vida (ECV) shows that the proportion of under 16 children which did not have a meal including fish, chicken or meat in the last 2 days doubled between 2019 and 2023.

4 The questionnaire is now ambiguous since smartphones can connect to mobile internet but when it was initially designed it was meaning to measure access to internet through computers.

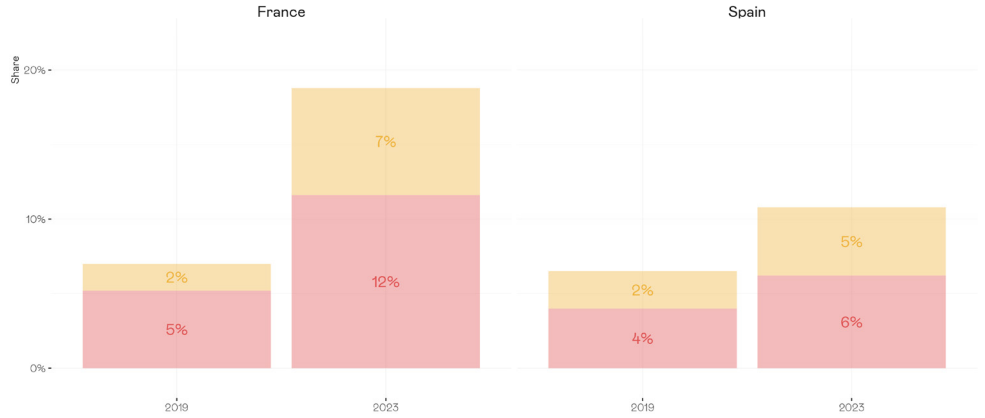
Figure 5. **Share of grade 4 reporting the following home items in TIMSS.** Spain and France



Primary pupils had less access to internet in 2023 than four years before, even after accounting for more widespread availability of smartphones. The decline in connections at home through a computer has not been fully compensated with the access to mobile networks. The share of French students without any access to internet more than doubled between 2019 and 2023, going up from 5% to 12%, see Figure 6. In Spain, it went up to 6% from 4%. Conversely, 4th grade children have more access to individual cell phones, with an increase of 11 percentage points in Spain and 25 percentage points in France.

Figure 6 - **Access to internet at home for grade 4 students in TIMSS**

None | Only smartphone



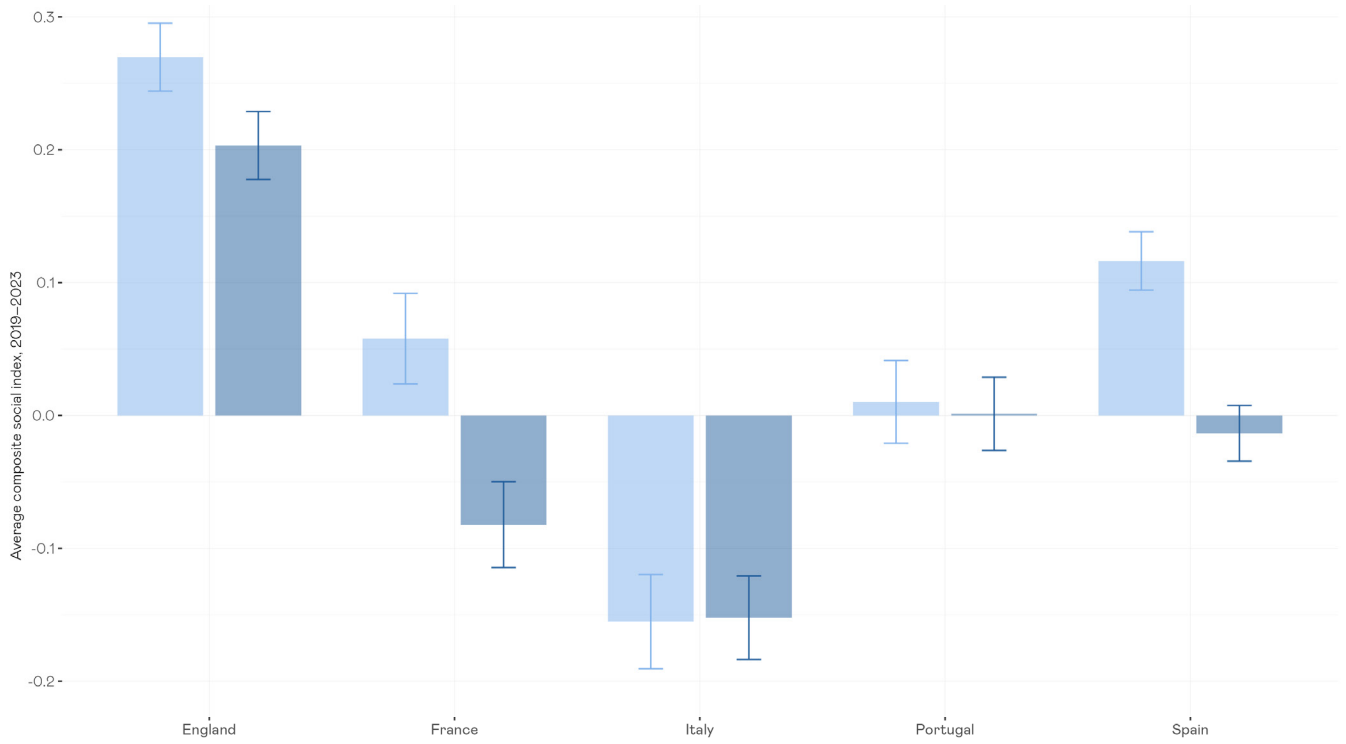
Source: TIMSS 2019 and 2023 microdata | EsadeEcPol

Parents in Spain and France report to have stimulated their children more intensely during early childhood. The TIMSS questionnaire asked parents at which frequency they engaged with their children in activities like singing songs, reading stories, or playing with blocks among other things.

All these activities have strong benefits on further learning during the Primary years and beyond. According to parents' responses, early stimulation is in fact stronger in Spain and France than in the typical OECD country.

In sum, in both Spain and France, the social context worsened on average between 2019 and 2023 for Primary grade students. Although various economic, cultural, linguistic, or social conditions do not have necessarily the same impact in all countries, one can build a composite social indicator to be able to compare social conditions and parental expectations and stimulation across countries. Such index was constructed to reflect the evolution of the factors discussed in this section and other relevant factors for student learning. To do so, one can look at the average statistical relationships between the various contextual variables and TIMSS scores across the whole sample and weight each factor according to its explanatory power to construct the index. As shown by Figure 7, the social conditions of pupils decreased significantly in both France and Spain. By contrast, they remained similar in Italy and Portugal but declined to a lesser extent in England. The decline in the social composite index is likely pushing scores down significantly in Spain and France as one additional standard deviation in the social composite is associated with scores being 40 points higher.

Figure 7 - **Comparison of the average social composite index in 2019 and 2023**



Source. Authors' calculations from TIMSS 2019 and 2023 microdata. The average is set to zero and the standard deviation to one over OECD pupils over the 2019-2023 dataset. The social index is the linear combination of contextual items that maximizes the explained variance of scores across the whole sample, after accounting for age, sex and school-level heterogeneity. The index is normalized over the group of OECD countries. The following contextual items are included: frequency of use of instruction language at home, books at home, children's books at home, educational goods at home, parents' education and occupations, hunger, immigration status (first-generation, second-generation, native), urbanization level, parents' expectations about the level of education the pupil may reach and stimulating activities during early childhood reported by parents. When the questions are asked to both the parents and the pupil, both items are included.

5. In practice, we use a mixed linear regression of TIMSS scores (averaging math and science) on the various contextual factors, accounting also for sex, age and school factors. This model is then used to project the social composite index for all pupils in the dataset. We can then compute average for countries by year. Here, we pool together the 2019 and 2023 microdata, to be able to display how social conditions overall evolved in various countries.

3. Learning quality in Spain and France is low in Primary

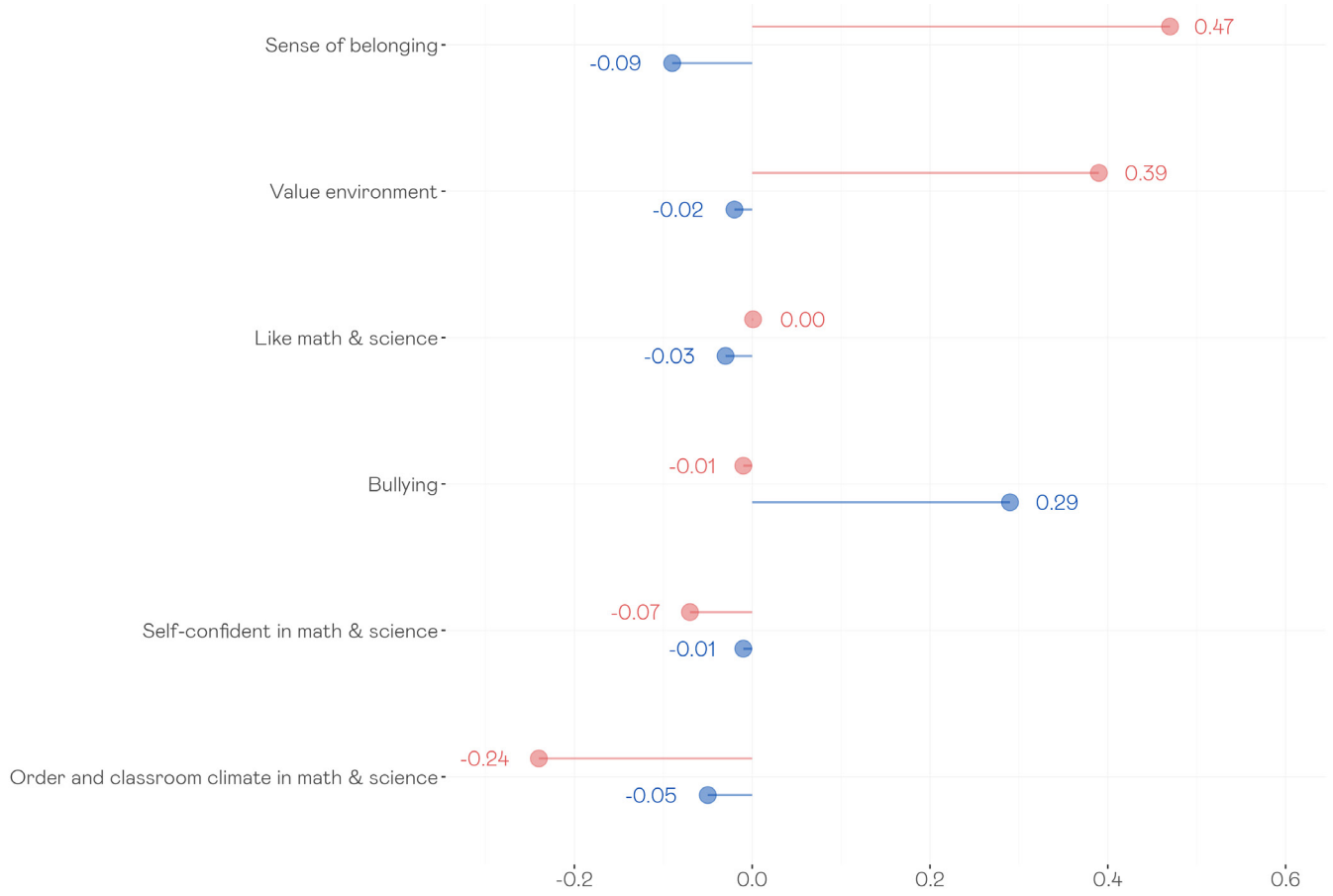
3.1. Defining "*Learning Quality*" of education systems.

Primary education systems have a multiple function of providing socioemotional development as well as solid academic and cognitive skills. Many of these dimensions can be measured to some extent by variables collected under the TIMSS assessment. While test scores in math and science obviously provide insights on the learning of basic cognitive skills, other TIMSS metrics shed some light on the building of socioemotional skills. The intensity and frequency of bullying is an indirect measurement of children's empathy and social norms among children. TIMSS also provides some measurement of self-confidence. On top of a direct measure of happiness in school, the survey also displays the extent to which pupils like to learn math and science and whether they value environmental preservation. Finally, items on order and climate during lessons, give some indications of the quality of student-teacher relationships, and the self-discipline of students.

While Spain is doing a reasonably good job in student wellbeing (except for classroom learning climate), socioemotional quality indicators in France are worse. All these dimensions are likely to be to some extent affected by the social background of students: we use statistical models to filter out the impact of social background, age and sex on all these dimensions and isolate the national specificities. As can be seen on Figure 8, bullying and taste for math and science is very close to the OECD average. Sense of belonging and the value given to environmental protection are much higher than benchmark countries. But pupils are not so self-confident and the climate in classrooms is significantly worse than in the rest of the OECD. In France, the measures are less contrasted, with all metrics being very close to the OECD average. While bullying is much less widespread than in the OECD, pupils are also a bit less happy, with the sense of belonging being lower than in other developed countries.

Figure 8 - **Dimensions of socioemotional development in Spain and France at grade 4**

Gap with respect to the OCDE average.



Source: Authors' computations from TIMSS 2023 microdata. All the indexes are built using Rasch models from the contextual items. The OECD average is zero and the standard deviation over the OECD sample is one.

In any country, pupils' academic performance is highly dependent of their parental background, culture, language, and behaviors. The relationships between all these factors and test scores are broadly similar in all countries and across time. However, for a given set of social factors, two similar pupils will score differently in two different education systems. Beyond living conditions and parents' behaviors, each education system's features also have large impact on children's performance. Teachers naturally influence their children's learning through differences in skills, training, motivation, hours of works and incentives. School organization and leadership sets the standards of schools as institutions that raise expectations and functioning norms regarding teachers, students and parents. But other things are equally determinant such as school infrastructure, teaching materials, the ambition of curriculum or assessment practices. All these factors do differ from one education system to the next inducing large differences in scores for a given set of social conditions. These structural differences in scores, once social factors and expectations are accounted for, can be regarded as a measure of "*Learning Quality*".

Learning quality of education systems can be defined as the gap between the average score in a country and what these scores would be if the students would go to school in the reference group. Learning quality can be seen as the number of points a pupil would gain or lose if she were to be taught in the country considered versus in a typical school of the reference group.

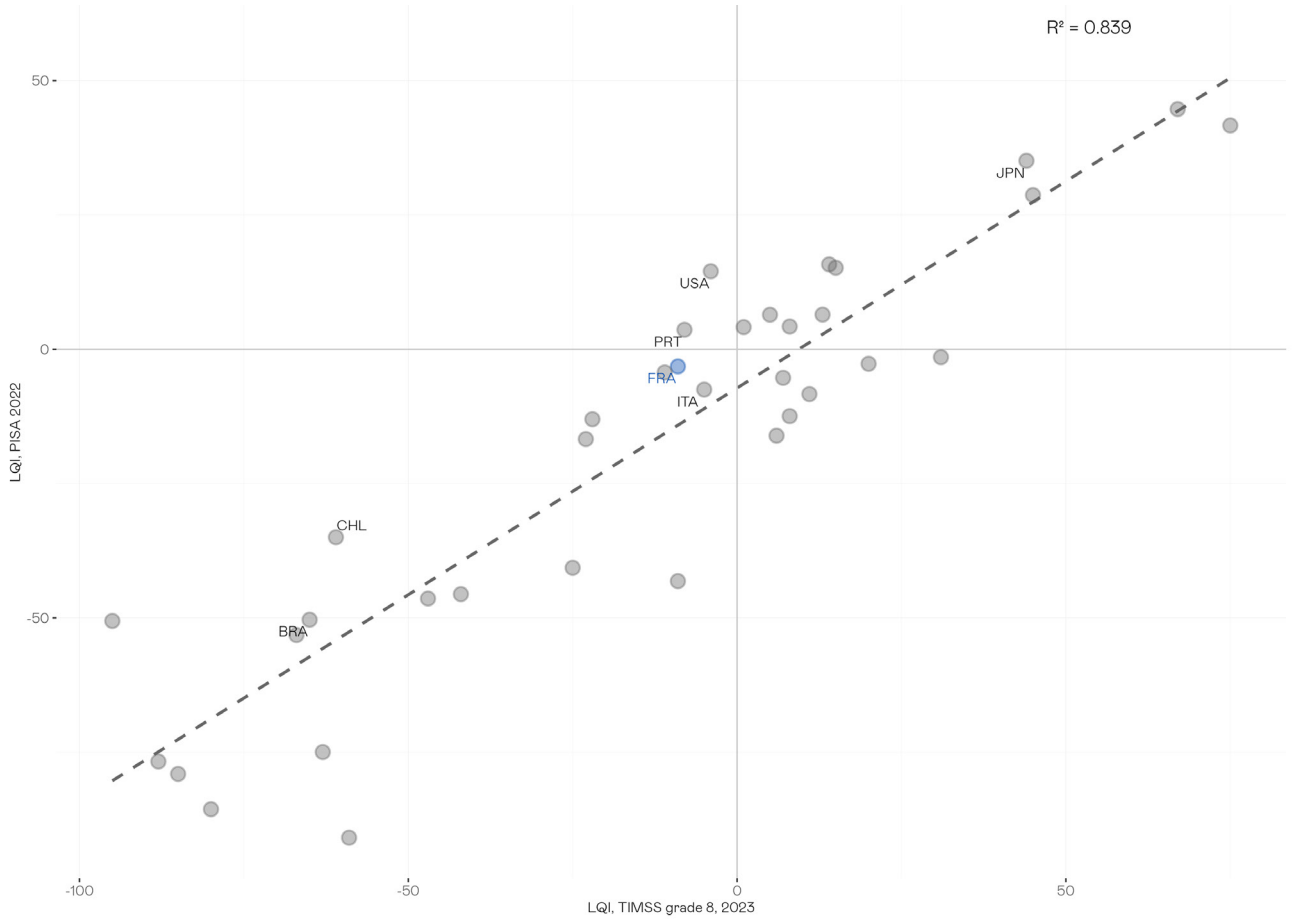
- **Any qualitative measurement requires a point of reference, in this case an alternative education system with which to compare each country.** Here we use the group of OECD countries that participated to TIMSS at grade 4 as the reference.

- **To compute this "*Learning Quality Index*" (LQI), for each pupil in the dataset we simulate what would be her score in each of the countries of the reference group, given her social index**. We then average these expected scores across all countries in the reference group. This expected score corresponds to the score a student would get if she could go to an "average" school of the reference group. Thus, we compare each country with an "average" OECD country.[6]

- **LQI outcomes for PISA and TIMSS in Secondary reveals that both measures capture the same phenomenon.** LQI can be measured at the Secondary level using either PISA or the TIMSS survey at grade 8. LQI measured in PISA is somewhat influenced by how effective learning is at the beginning of upper Secondary education in some systems, like France, although not Spain.[7] Given that TIMSS 8th and PISA 2022 assessed close cohorts, and at close levels, one can compare using both datasets. The results in Figure 9 display a high cross-country correlation, about 0.92, which reveals that TIMSS and PISA are capturing very similarly the quality of education systems. Although cognitive items[8] and contextual questions both differ, the measures of learning quality are quite close, which supports the relevance of the concept.

6. **Note that LQI can be measured using any international students' assessment with a precision that depends on the number and relevance of the contextual data collected on students and their family**. Learning quality measured at different levels of education can differ. Recruitment, training, curriculum, hours, assessment, and infrastructure may indeed be different at the Primary, lower Secondary or upper Secondary level. There is therefore no reason to assume that a country where students outperform at a given level would necessarily display high quality at other levels. Although learning quality measured at the Primary and lower Secondary level are quite correlated in practice, there are examples of countries, such as Spain or France where they differ.
7. Since PISA is testing 15-year-olds and not students from a specific grade, most of the sampled pupils are in grade 10. This corresponds to the beginning of upper Secondary in most countries. However, some students sampled are still in lower Secondary, because of delayed entry or repetitions.
8. For instance, the PISA score is mixing reading, math and science while TIMSS only measures math and science.

Figure 9 - **Comparison of LQI using TIMSS 2023 at grade 8 and PISA 2022 at age 15**



Source: Author's computations using PISA 2018, PISA 2022, TIMSS 2019 and TIMSS 2023 microdata. We used a linear mixed model to compute learning quality, accounting for heterogeneity in classes. | EsadeEcPol

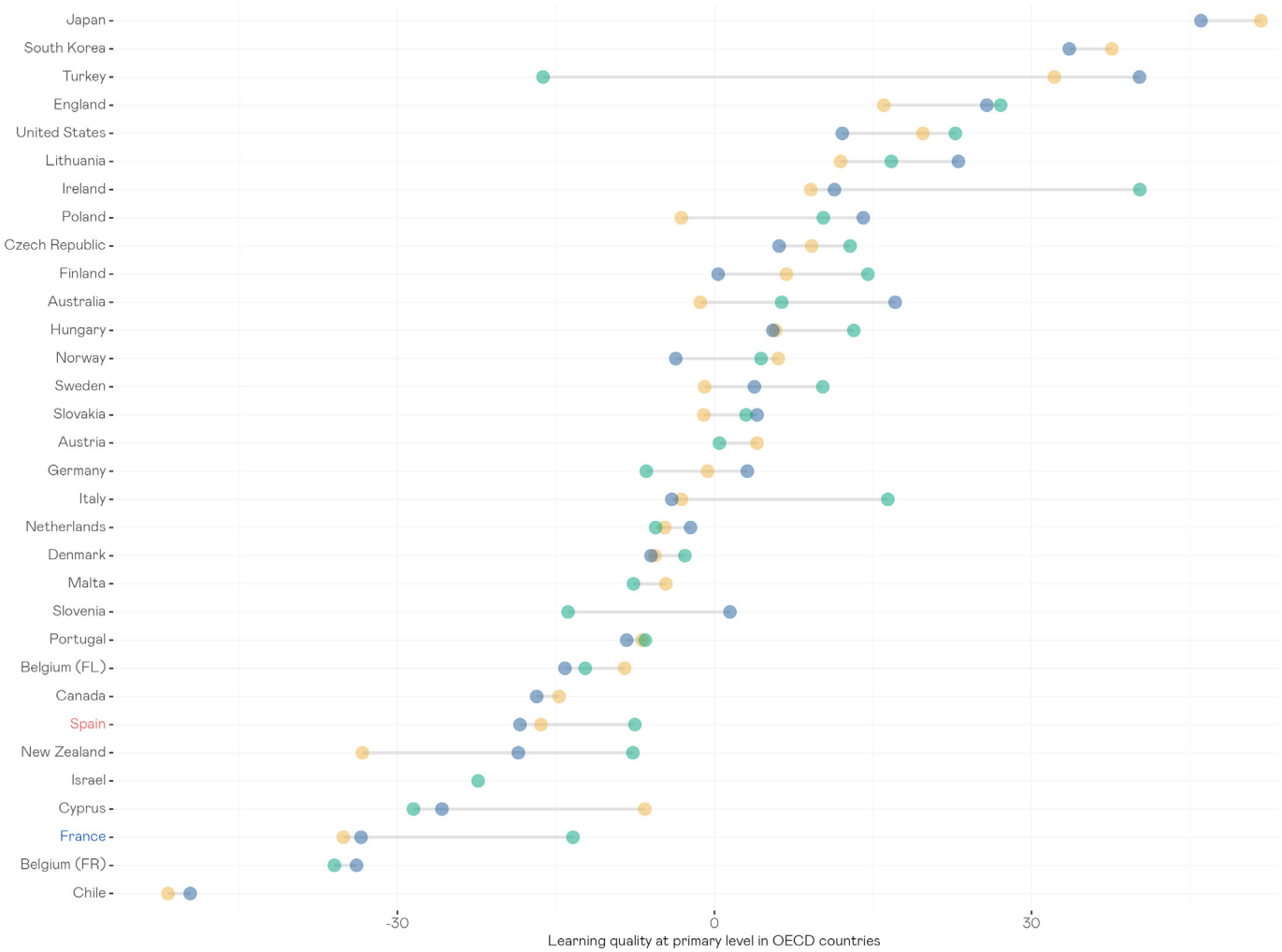
→ **Another argument for validity of our Index is that measures of "*Learning Quality*" computed using subsequent waves of a given assessment remain very close.** The correlation coefficient of LQI is about 0.96 for TIMSS at grade 4 between the 2019 and 2023 survey. The correlation coefficient is lower, about 0.65 when one compares reading scores from PIRLS 2021 and TIMSS 2023 scores in math and science. This highlights that teachers and systems may have different efficiencies, orientations and prioritization in teaching reading and science.

3.2. Learning quality in Primary is close to average in Spain and lower in France.

Spain and, especially, France are located at the bottom of OECD countries in our "Index of Learning Quality" at the Primary level. As shown in Figure 10, TIMSS scores adjusted for social factors and parental expectations of Primary pupils in math and science were about 18 points below the OECD average in 2023 in Spain. The value of the Index was 33 points lower in France than in a typical OECD country. Such a difference represents about 0.6 years of schooling[9]. In other words, a French student would gain about 0.6 year of schooling if she could move to a typical OECD education system.

Figure 10 - **Learning quality in OECD countries at the Primary level using recent PIRLS and TIMSS surveys.**

Based on PIRLS 2021, TIMSS 2019 and TIMSS 2023



Sources: Author's computations using PIRLS 2021, TIMSS 2019 and TIMSS 2023 microdata. | EsadeEcPol

9. We assume here that 50 TIMSS points represent one year of schooling. This correspondence is estimated directly from the TIMSS 2023 microdata in which several countries administered the test to both fourth graders and fifth graders. This allows to evaluate the impact of going up one grade using a regression, where age and social factors as well as school effects are accounted for.

To put it bluntly, the equivalent economic losses associated with the lower quality of Primary education in France and Spain are considerable. Given the economic returns of education and, more specifically, Mathematical learning, through higher probabilities of holding a job and higher earnings, a French pupil will earn about 50,000 euros less over his all career[10] than a typical OECD student. This is larger than what the French society is spending for each Primary pupil. The economic cost of low-quality amounts to 44 billion euros for each cohort that goes through Primary school in France. This amount is more than half the yearly public spending for the whole education system. Economic losses associated with lower quality than OECD average of Primary education in Spain are in the same order of magnitude. Primary students in Spain are about 0.2 years behind those in a typical OECD country, after accounting for the distribution of social factors: productivity and employment losses associated with less skilled youth will result in lost wages in the order of 7 billion euros for each cohort in Spain.

10. These numbers are derived from econometric estimates linking literacy and numeracy scores in both countries to labour earnings from the recent OECD's adults' skills PIAAC survey (Program for the International Assessment of Adult Competencies). The full methodology and numbers can be found in Cahu and Søndergaard (2025, forthcoming). Additional labour earnings associated with higher scores in basic skills are actualized and cumulated throughout the career of workers.

3.3. Learning Quality in Secondary is higher in both Spain and France.

Learning Quality at the end of Primary and lower Secondary levels can be compared easily with the TIMSS surveys. There is a 4-year's timespan between two consecutive assessments. The cohort tested in 2023 at grade 8 was the same that the one that was tested at grade 4, 4 years earlier. As most countries are participating to both assessments on a continuous basis, this gives clear indications on how the tested cohort progressed vis-à-vis other participating countries during lower Secondary. The comparison displayed on Figure 11 shows that learning quality at both level is highly correlated.[11] Spain is included with the learning quality indicator in PISA 2022. These results are similar when we use the PISA data to gauge Learning Quality at the beginning of upper Secondary.

Figure 11 - **Comparing LQI in Primary with TIMSS 4th and lower Secondary with TIMSS 8th (four years later).**

Source: Author's computations from TIMSS 2023 (Grade 8) and TIMSS 2019 (grade 4) microdata | EsadeEcPol
Spain has been added although it did not participate to TIMSS at grade 8 with learning quality being projected from PISA 2022.

11. The correlation coefficient is about 0.91.

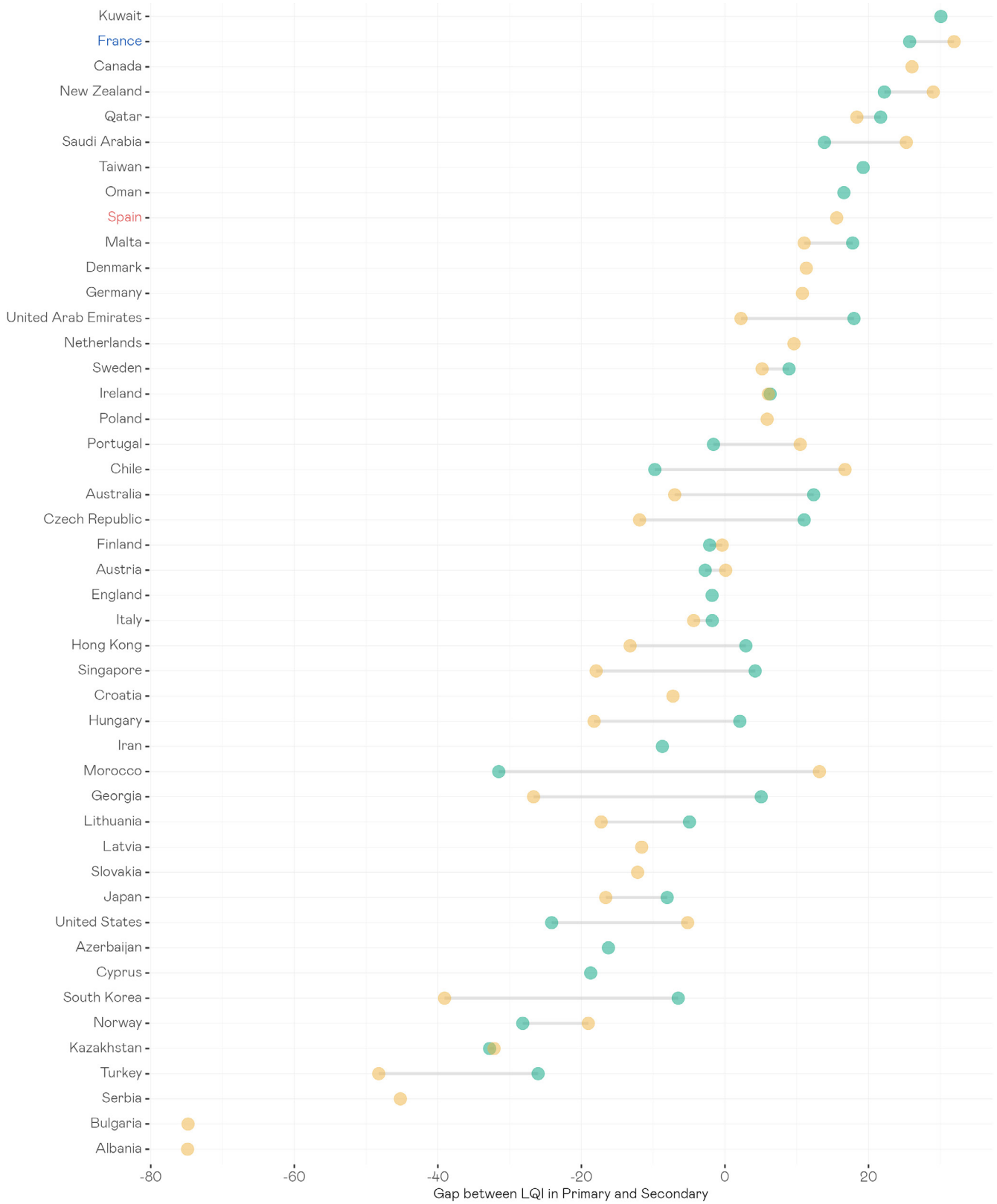
French and Spanish pupils do progress considerably between Primary and lower Secondary. Learning quality measured at the end of lower Secondary is determined by the cumulated impact of both Primary and Secondary schools. The quality of the Primary level can be directly observed thanks to surveys at grade 4. It is therefore possible to compute how the lower Secondary level is faring by comparing scores at grade 4 in 2019 with scores at grade 8 in 2023. The difference between learning quality (LQI) at grade 8 or 10 and grade 4 is very large, putting both countries on top of the country ranking regarding progress between the two levels. This difference amounts to 25 points[12] for both France and of 18 points for Spain, meaning that teenagers learn much more in France and Spain than in the typical OECD country during lower Secondary (Figure 12).

Learning gains at the lower Secondary level are compensating lower learning quality at the Primary level. French and Spanish pupils lose ground in the Primary years compared to their OECD counterparts. Our measurement of the gap of LQI with OECD is about 30 points for France and 16 points for Spain in Primary. But then French pupils make up for some distance at the lower Secondary level, ending up with a gap reduced to 8 points at the age of 15. Spanish students fully compensate for their lower quality at the Primary level and even overtake the average OECD pupil, scoring 8 points above average following our quality metric.[13]

12. At each step, we adjust scores from social factors to compare countries that may differ in the distribution of social and linguistic conditions as well as in parents' behaviors and expectations.
13. Here we consider scores adjusted for social factors.

Figure 12 - **Gap between LQI measured at grade 4 and at grade 8 or at age 15 (PISA) 4 to 6 years later**

Based on PISA 2022 and TIMSS 2023 results

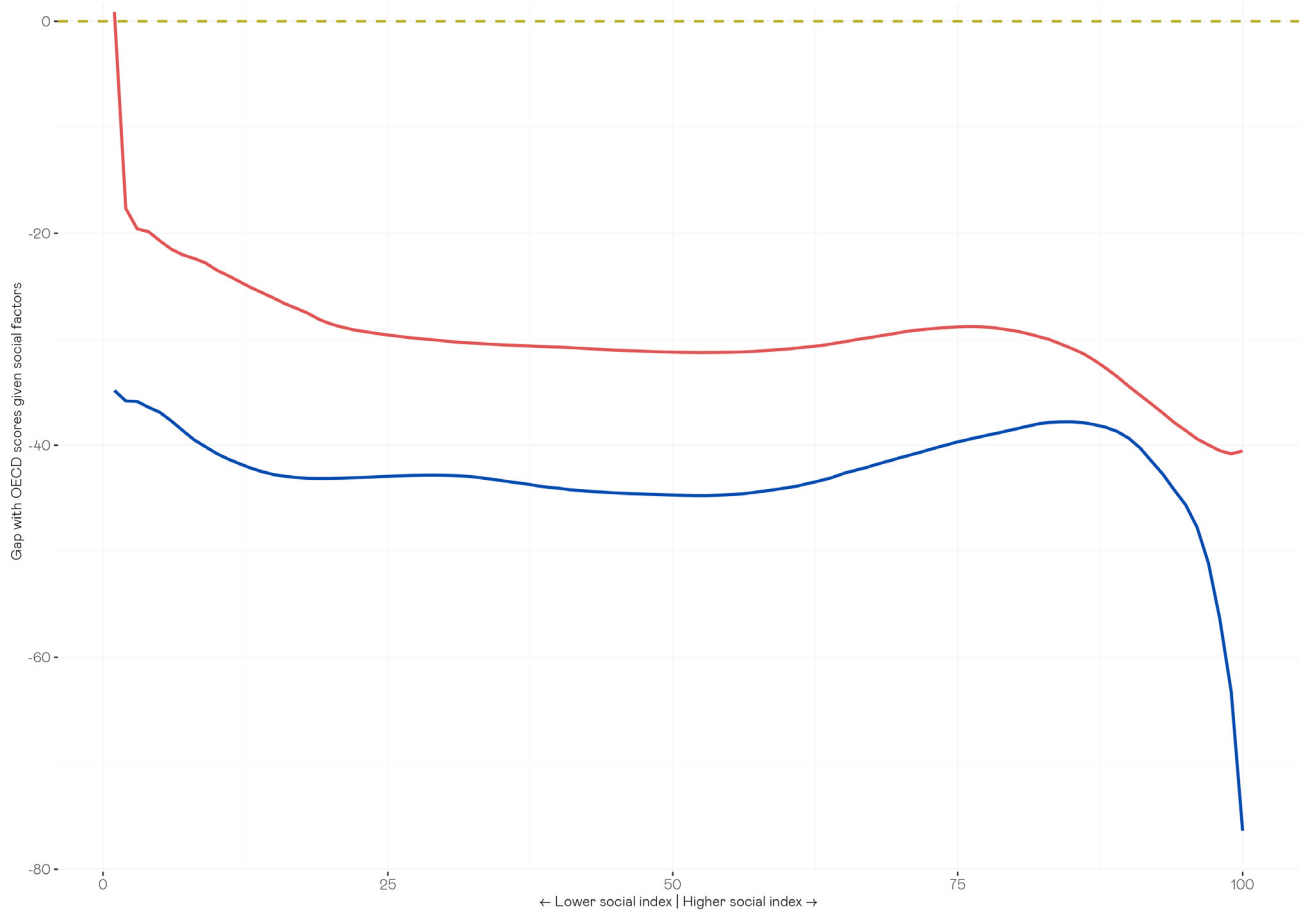


Source: Author's computations from PISA 2022, TIMSS 2023 (Grade 8) and TIMSS 2019 (grade 4) microdata | EsadeEcPol

3.4. Learning Quality is worse for the most socially favored students.

In both France and Spain, the children who are further away from OECD peers are the most socially favored. Poor children are more likely to state hunger when they arrive at school, to have parents are the least educated and most often do not speak the instruction language at home. They do not work or hold elementary occupations. The poorest children are those who have no books at home and whose parents seldom engaged with them during early childhood in play. Symmetrically, the most favored children are those whose parents are the most educated, hold most skilled occupations, own much cultural goods such as books and stimulated their children the most during the early years. These children at the upper end of the social distribution are not the wealthiest. They are typically the progeny of teachers. Expected scores given social conditions are indeed closer to the OECD average for the poorest children and the gap increases sharply for the students at the top of the social ladder, see Figure 13. This could be certainly seen as a good thing if the average quality was not so low. Academic performance of the top decile of the population in both Spain and France is much lower than that of the rest. On can think of two types of complementary explanations: (i) favored kids do not have to work very hard to maintain their social status in later stages in life and (ii) curriculum and teachers are not ambitious enough, especially for the most able students, who are often children of the most educated citizens.

Figure 13 - **Gap in TIMSS scores at grade 4 between Spain or France and OECD countries by percentiles of the social index in 2023**



Source: Author's computations from TIMSS 2019 and 2023 (Grade 4) microdata | EsadeEcPol
The percentiles are computed at the national level, so within the Spanish 2023 sample for Spain and within the French 2023 sample for France.

4. Why is Learning Quality low at the Primary level in France and Spain?

4.1. A social "perfect storm" explains mostly why scores declined

Children's learning has been suffering from unfavorable changes in living conditions. Learning outcomes are highly dependent of linguistic, social, economic or cultural features of households. Children who learn the instruction language at birth are likely to perform better at school, while pupils with more educational goods such as books, especially for children, a desk, a computer are also favored. Parents' education, occupations and stimulation particularly during the early years also matter. During 2019 and 2023, both Spain and France saw some evolutions in these social aspects that have had negative impact on pupils' performance.

Despite marked demographic trends, nutrition and the switch from computers to smartphones explain most of the decline in performance. Spain has been marked by demographic changes, whereas more students are from foreign ascend and more of them are not speaking the language of instruction at home. While being born abroad brings a small disadvantage, not speaking the instruction language at home is more detrimental. But despite changes in the structure of the population, the overall effect on Spanish scores is barely noticeable. France was not impacted by similar migration trends. In both countries however, scores were mostly affected by children being more often hungry and having less access to household items favorable to learning. Primary pupils for instance, more often possess their own smartphone[14]. However, they are also less likely to have a desk, a computer or tablet and a fixed internet connection. This switch from a fixed workstation to a mobile setting, from a computer to a smartphone has noticeable impacts on learning. It represents a loss of 2 points in Spain and 3 points in France. Fathers are also found to holding less skilled occupations and this does matter in France. But what has the most impact was the fact that children have been reporting more often to be hungry at school. This recent unfavorable trend in nutrition is also pushing down scores; by almost 3 points in Spain and by 4 points in France. This social impoverishment was significant in both countries. A counterfactual analysis shows that because of these evolutions, TIMSS scores at the Primary level should have declined by 5 points in Spain and 6 points in France, in both science and math. Given that they declined by about 7 points on average in Spain and 3 points France, adverse changes in social conditions explain most of the decline in scores in both countries.

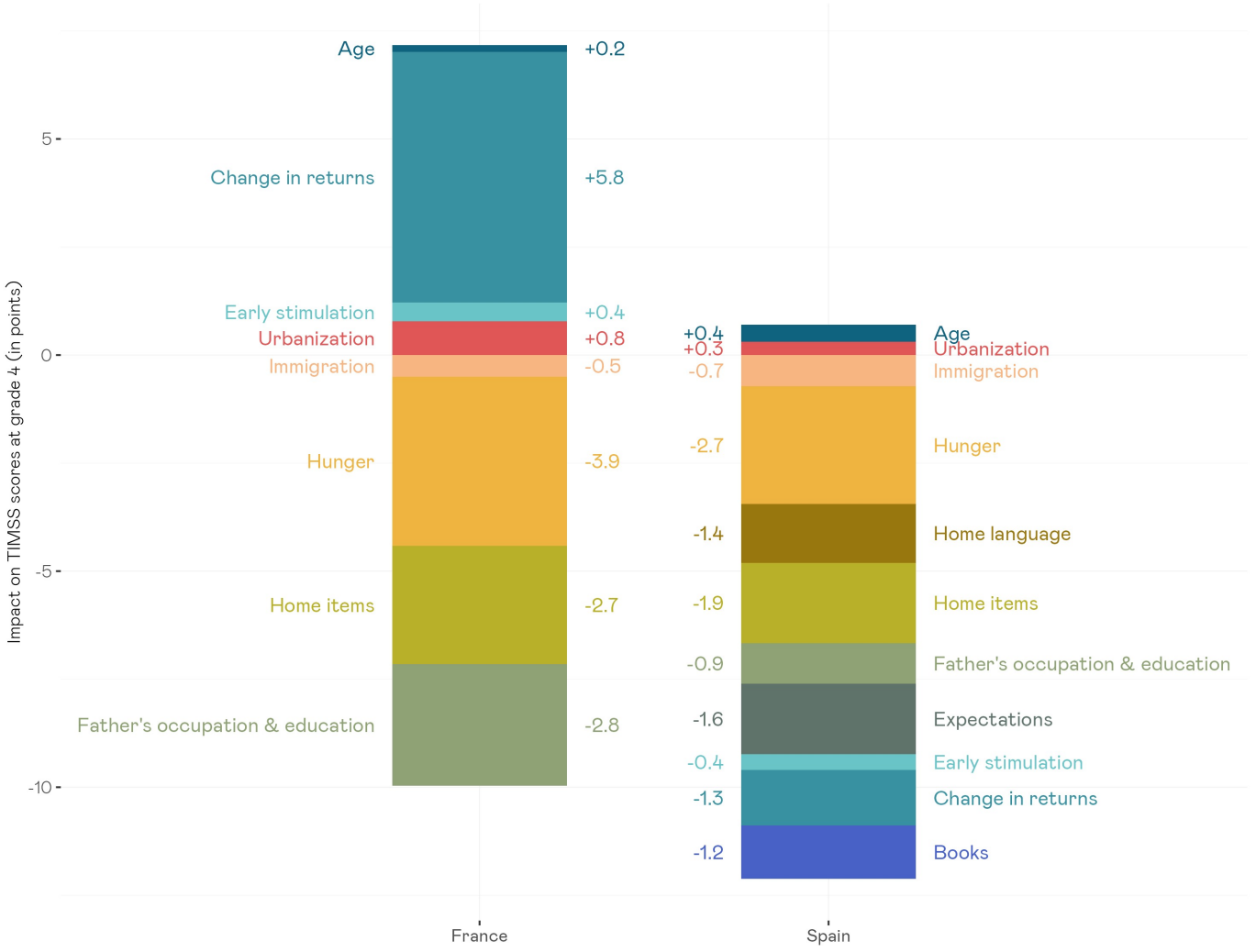
The overall Learning Quality of the education system slightly increased in France but not Spain. In Spain, the way each factor impacts the scores did not change[15]. In France however, there was a likely shift in overall performance, which partially compensated the worsening living conditions of children. Part of this favorable trend may be related to a policy of reducing class sizes in early grades, targeted to the poorest neighborhoods or "Réseau d'Éducation Prioritaire". This connection, which

14. In 2019, the TIMSS questionnaire broadly asked about "own cell phone". In 2023, it was more explicit, only asking about "own smartphone". Therefore, the comparison of two statistics may underestimate the increase in cell phone ownership amongst Primary pupils amongst grade 4 pupils. Approximately half of grade 4 pupils sampled in TIMSS are 9 while the rest are 10.
15. The extent to which each factor is affecting scores is called "return" of this factor on score.

cannot be proved using the TIMSS data, looks plausible because most of the gains in performance were concentrated amongst the poorest deciles of the population while the richest ones suffered from a marked decline[16].

Figure 14 - **Contributions of social factors evolution to change in TIMSS scores at grade 4, 2019-2023 Factors contributing to improvement are placed above zero; factors contributing to score decline are placed below zero**

Factors contributing to improvement are placed above zero; factors contributing to score decline are placed below zero.



which disentangles the effects of changes in factors from changes in the effects of such factors (the returns). In Spain, the effects of each factor (the returns) remained the same between 2019 and 2023 while in France there were some structural changes which played a positive role on quality. Such structural change compensated to some extent the decline in scores due to children being hungrier, fathers' holding less skilled jobs and families moving away from fixed computers with access to broadband to smartphones for kids.

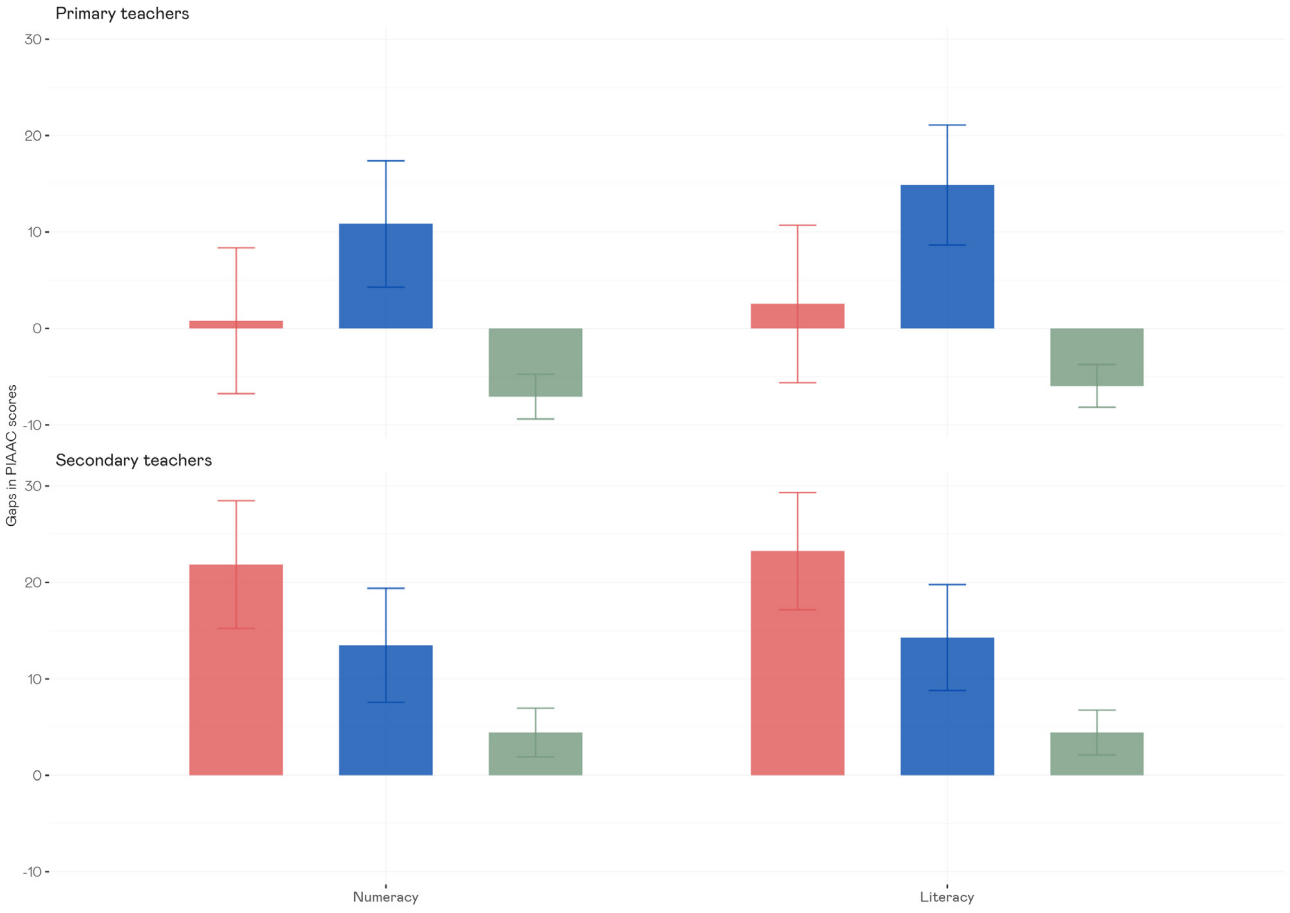
16. But better teaching practices may have also contributed.

4.2. Primary teachers are skilled enough to provide good learning quality

The level of basic skills of teachers, in literacy and numeracy can be known in each OECD country thanks to the recent PIAAC survey, which was released in December 2024. Evidence from the first PIAAC data shows that teachers academic foundational skills might in fact explain part of the cross-country variation in student academic learning (Hanushek et al, 2019). However, when compared to other workers with higher education, the level of cognitive skills of Primary school teachers is higher in France and around the average in Spain[17], see Figure 15. This is strong evidence that the cognitive skills of Primary school teachers are not to blame for the fact that pupils are not learning as much as they could. In France, Primary teachers are in fact much more skilled than the average adult with tertiary education, a situation which is rather rare. For the case of France, challenges the mistaken perception that primary school teachers are not among the most qualified workers of their generation, attributed to the insufficient salary valuation of the profession. For the case of Spain, it shows that there is room for improvement towards higher teacher cognitive skills in Primary in a similar path to what has been achieved for Secondary teachers.

Figure 15 - **Teacher Gap in PIAAC scores in numeracy and literacy**

Between Primary/Secondary teachers and other adults with tertiary education in Spain, France and OECD average



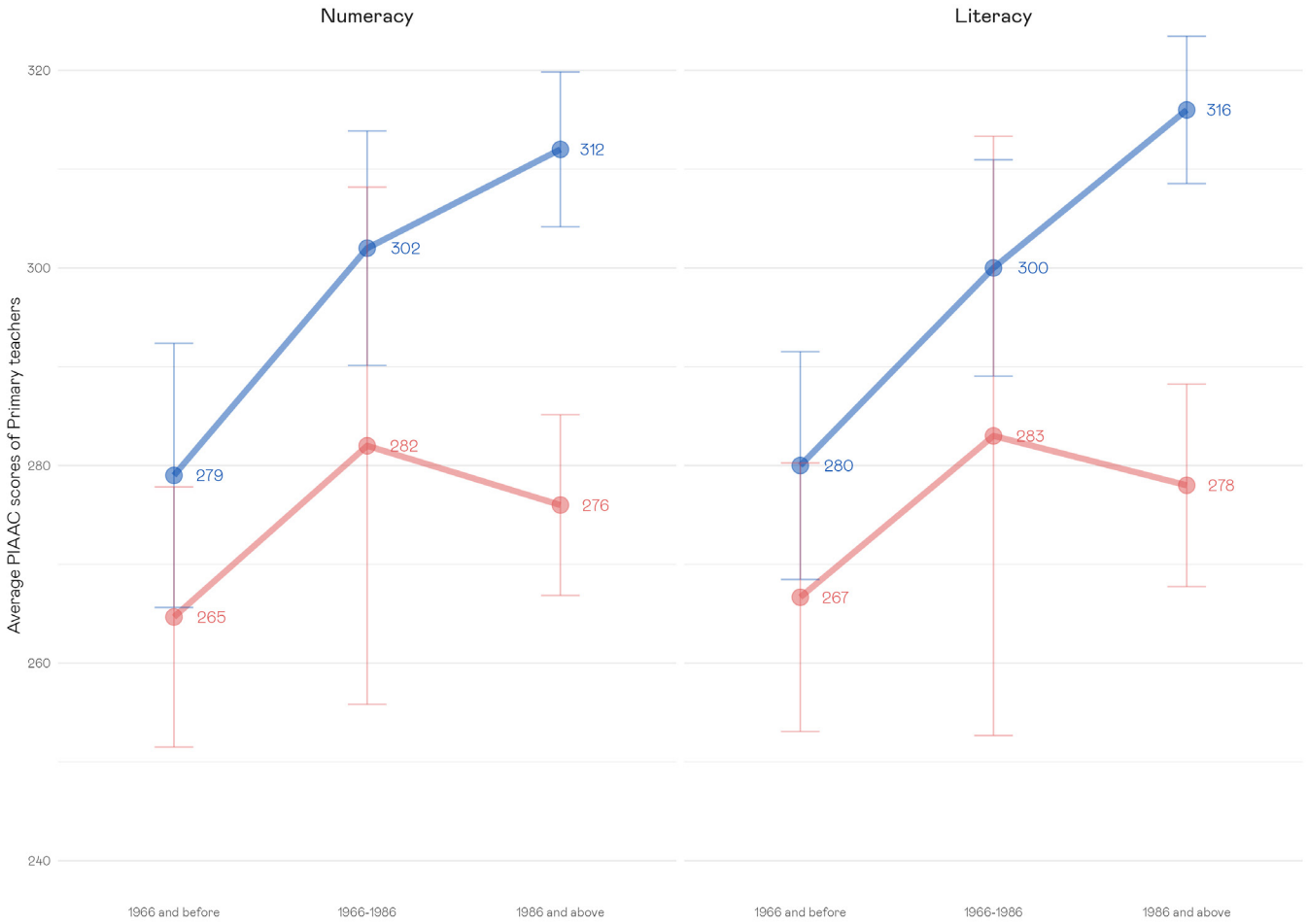
Source: Computations from PIAAC 2023. Error bars indicate confidence interval at 95%.

17. The skills gap between Spanish Primary teachers and other adults with tertiary education is positive and larger than in the OECD. But the difference remains within the margin of error, contrary to France, where Primary school teachers are significantly more skilled relative to the adult population with tertiary education.

Primary school teachers in Spain and France are not among the top skilled in the OECD but their cognitive level has also been increasing across generations. In France, teachers born after 1986 are more skilled than all the generations before, see Figure 16. The gap with people with tertiary education has also increased in the last 30 years, meaning that Primary teacher has become a more selective occupation. In Spain, the generations born after 1986 are slightly less skilled than the generation born between 1976 and 1985. But the skills gap between Primary teachers and other people with tertiary education amongst the youngers is only about of a few points. In any case, there has been no decline in the cognitive skills of Primary teachers in Spain.

Figure 16 - **Evolution of literacy and numeracy skills of Primary teachers**

In France and Spain by birth generation from PIAAC



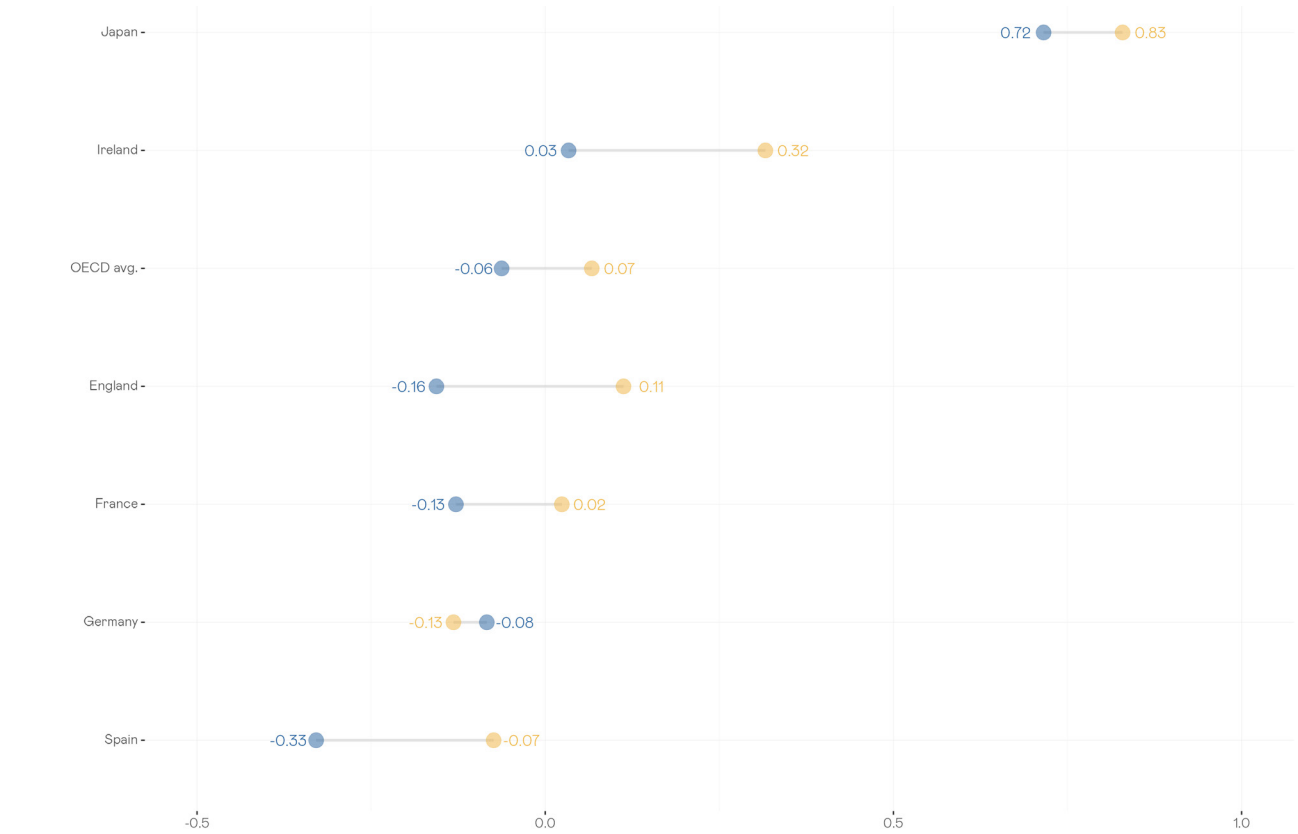
Source: Authors' computations from PIAAC | EsadeEcPol

Only Primary teachers are included. Error bars indicate confidence interval at 95%.

4.3. Student's behaviors and learning climate are worsening

The learning climate in the classroom during math lessons used to be close to the OECD average in both Spain in France in 2019, likely resulting in academic decline. But like in most OECD countries, it has deteriorated since the pre-pandemic area[18]. Although the causes of this shift are not obvious, it is likely to have contributed to the global decline in academic performance. The decline is statistically significant, as indicted by the error bars on Figure 17, which mark the confidence interval at 95%. Rising disorder in Spanish and French classroom at the Primary level is likely to have had adverse impact on student's performance: a model of scores accounting for disciplinary climate on top of social factors and class-specific effects suggests that this may have cut math scores by 5 points in Spain and 3 points in France.

Figure 17 - **Evolution of the disciplinary climate in math lesson at grade 4**
TIMSS 2019 and TIMSS 2023 results



Source: Authors' computations from TIMSS 2019 and 2023 microdata | EsadeEcPol
The index is normalized over the group of OECD country. The index is built by combining items using a Rasch Bayesian model.

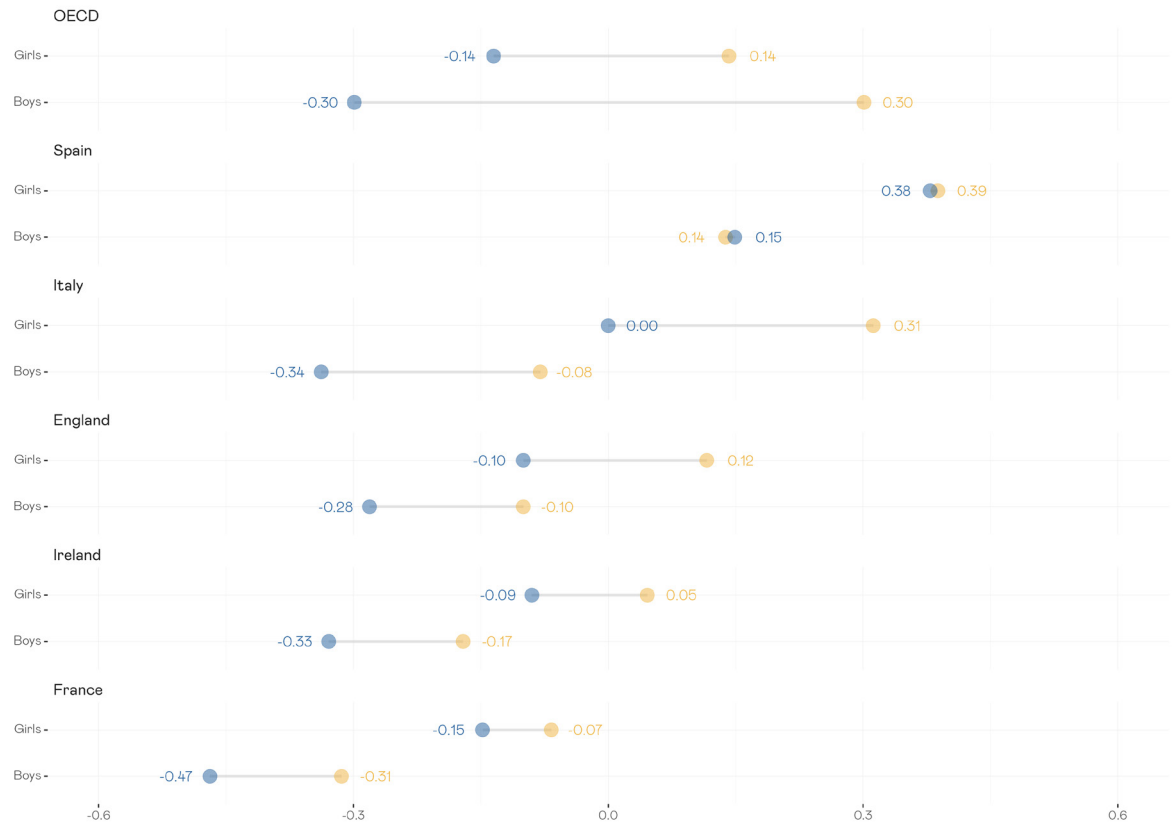
Reported hunger and fatigue in class could be two determining factors in the learning environment within the classroom, even more so than social background. The impact of reporting hunger when arriving at school on the classroom environment is particularly significant: 80% of classes in which most students report arriving hungry are characterized by a noisy atmosphere that hinders learning, compared to 40% of classes in which none of the students report this situation. The decline of the disciplinary climate in France is highly related by children feeling hungrier in 2023 than in 2019. Since

18. As displayed in the graph, the disciplinary climate worsened in the OECD, but still much less than in Spain.

disciplinary climate has a direct impact on learning, it is a likely channel through which hunger felt by children hamper their learning.

Sense of belonging and level of reported bullying has also worsened in Spain and France, which may have had an impact on learning. Sense of belonging is an index measures a combination of items related to student attachment to school: Spain was a top country in such matter back in 2019. However, the situation has worsened since then, as in most OECD countries. In Figure 19, positive values imply higher levels of bullying (relative to the OECD average), while negative values imply low levels of bullying in school.

Figure 18 - **Index of sense of belonging in school by year and gender**
TIMSS 2019 and TIMSS 2023 results

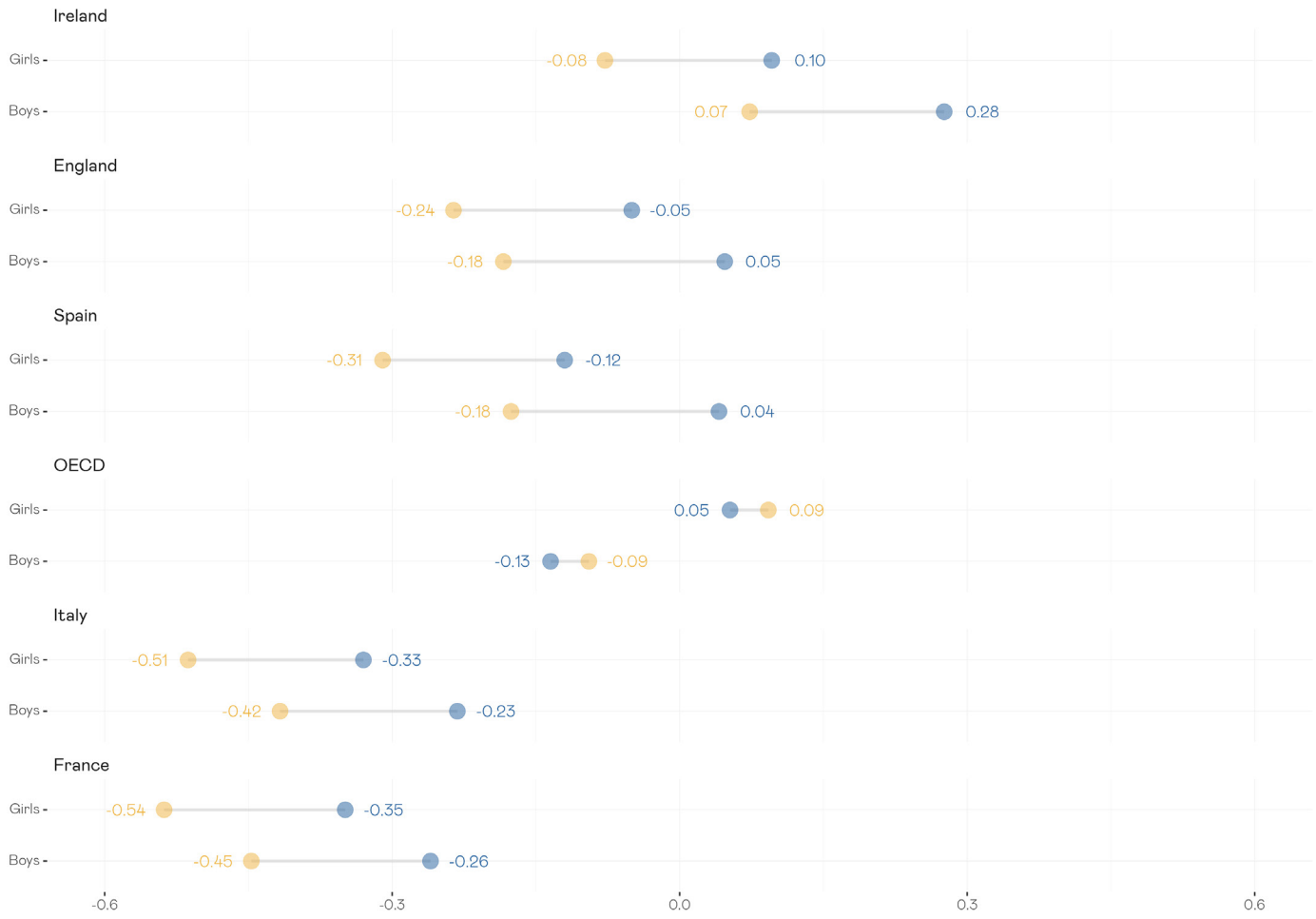


Source: Authors' computations from TIMSS 2019 and 2023 microdata | EsadeEcPol
The index is normalized over the group of OECD country. The index is built by combining items using a Rasch Bayesian model

Although less a concern than in most OECD countries, bullying has also increased. Moreover, reported bullying by Primary pupils used to be rather low in Spain and France prior to the pandemic, see Figure 19: positive values imply higher bullying (relative to OECD mean) while negative values imply low bullying at school. The situation has worsened however since, like in most OECD countries. Bullying in Spain is now only slightly lower than in England while it remains rather limited in France, in comparison with other countries. More frequent and more intense negative behaviors between peers and lower sense of belonging are naturally weighing down academic performance.

Figure 19 - **Index of bullying by gender and year of survey**

TIMSS 2019 and TIMSS 2023 results at grade 4



Source: Authors' computations from TIMSS 2019 and 2023 microdata | EsadeEcPol
The index is normalized over the group of OECD country. The index is built by combining items using a Rasch Bayesian model with OECD of 2019-2023 sample average at 0. Positive values of the index indicate more frequent bullying

4.4. Teaching practices are above average in Spain but not in France

Teaching practices are not directly observed or assessed in international students' survey, which is a major limitation of these assessments. Although subject to self-perception bias, it is possible to gauge the effectiveness of teachers thanks to their own responses to the teachers' questionnaire. Teachers interviewed under the TIMSS survey were asked a battery of questions related to several dimensions displayed in Table 20. Their answers can be compared with students' scores to indirectly identify practices and beliefs of teachers that may hinder of boost pupils' learning.

Table 1 - **Examples of items in the teachers' questionnaire used to assess**

Domains	Example of items
School emphasis on academic success	How would you characterize Teachers' expectations for student achievement? (Rated very high to very low).
School Environment	The students are respectful of the teachers (Rated Agree a lot to disagree a lot).
Teacher morale	I am enthusiastic about my job. (Rated Very often to never).
Teacher challenges	I have too much material to cover in class (Rated Agree a lot to disagree a lot).
Teaching practices	I Ask students to explain their answers (rated every lesson to never).
Views on student's limitations	Students lacking prerequisite knowledge or skills (Rated not at all to a lot).
Use of digital devices in class	How much not knowing how to use digital devices to improve student learning keeps you from incorporating digital devices into mathematics instruction? (Rated not at all to al lot).
Topics taught to the class	Add and subtract up to 4-digit numbers (rated mostly taught before this year to not yet taught).

Source: TIMSS 2023 teachers' questionnaire.

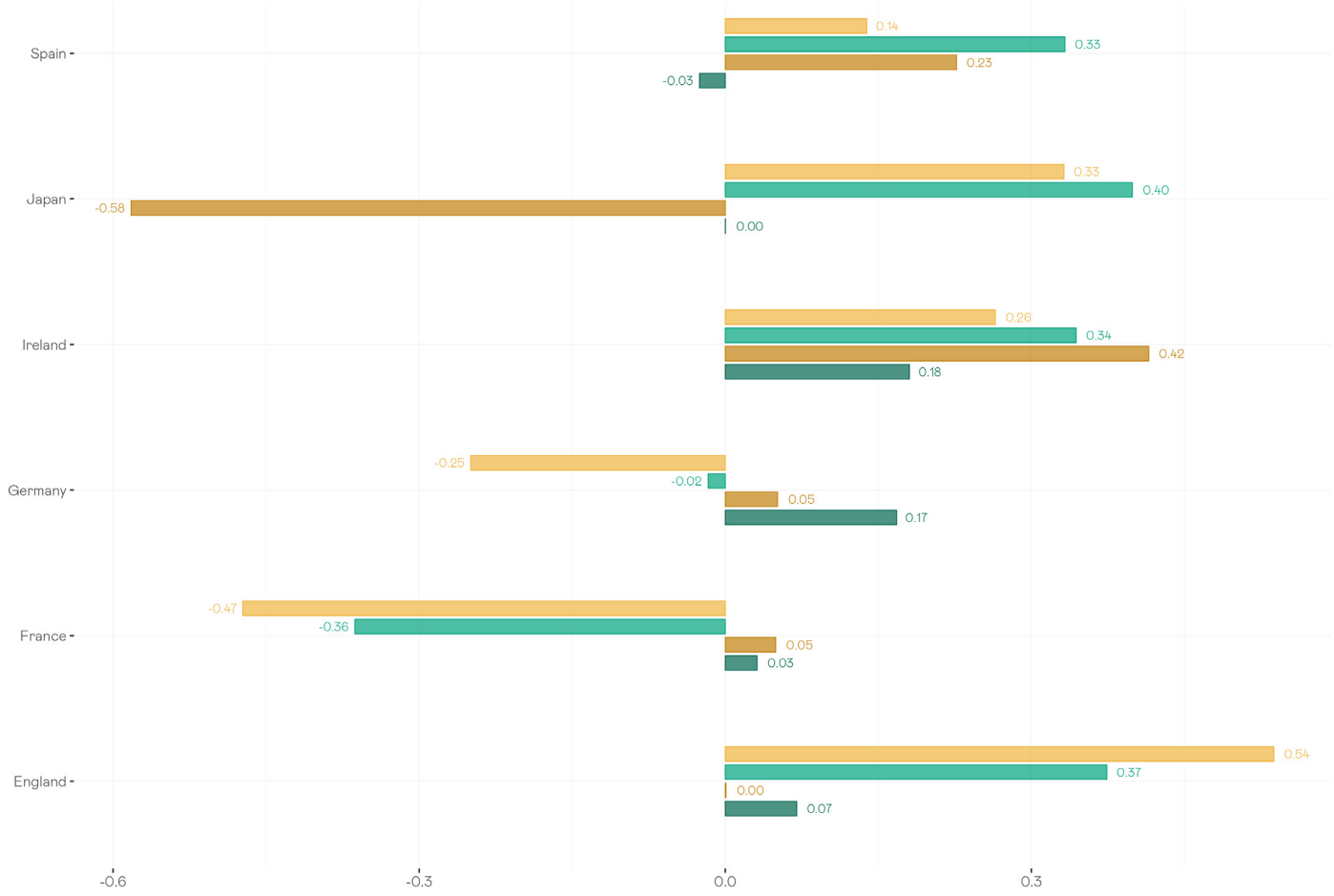
Teaching practices are better in Spain than in OECD countries, whereas it is worse in France. One can also use questions asked about them to the students. There are only a few of these items but they are correlated with students' scores[19]. These two different sources give a rather consistent picture. **Teaching practices in Spain are clearly better than in the typical OECD country**, see

19. For instance, students were asked to rate how much they agreed to the statement "My teacher is easy to understand » or « My teacher gives me helpful feedback on my work".

Figure 21. Teaching practices in France are likely quite inefficient, however. Indexes built from teachers' answers give a less favorable picture of teacher efficiency in France than the one based on students' answers: this underlines that beyond behaviors, the beliefs held by teachers and expressed in the survey may have a significant impact on their performance. These findings are consistent with what other international surveys have been reporting, such as Talis 2018. They are logically explained by the fact that the French teachers are not well trained in class management and only benefit from limited practical experience before being attributed the responsibility of a class. In Spain, students rate teaching practices lower than teachers do, suggesting an overconfidence bias from teachers that requires additional attention and analysis.

Figure 20 - **Combined Index of teaching practices**

Math questionnaires from Teachers and Students and Science questionnaires from Teachers y Students



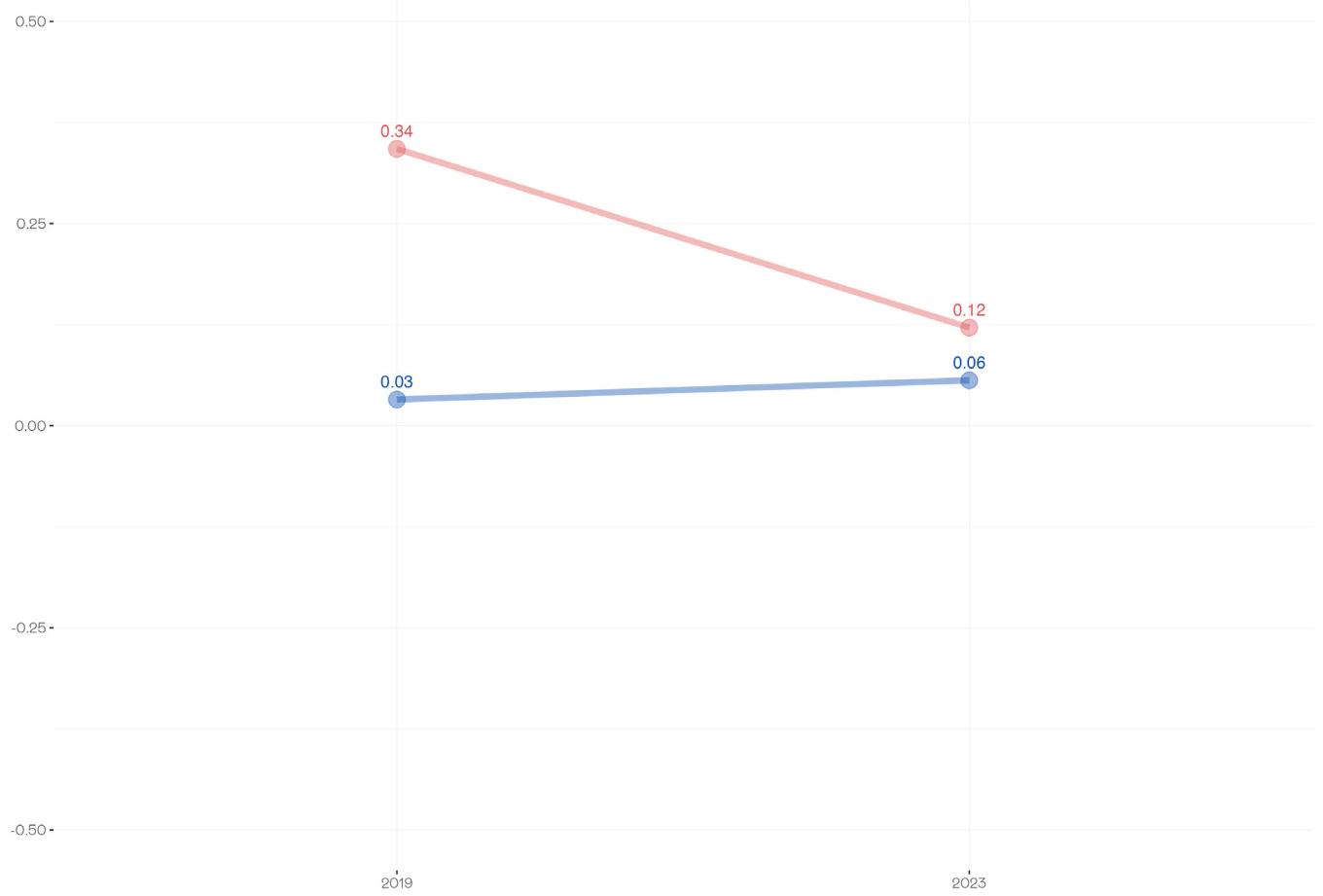
Source: Authors' computations from TIMSS 2019 and 2023 microdata | EsadeEcPol

The indexes are built using contextual questions combined to maximize the explained variance of the math and science scores, after accounting for age, sex and social factors at both the individual and class level. Zero is the average in OECD countries.

Teaching practices may have deteriorated in Spain and improved in France. Teaching practices, estimated from students' reports have deteriorated significantly in Spain since 2019. In France, practices have improved marginally, but the difference is not statistically significant. There is no apparent explanation for teaching practices becoming less efficient in Spain since 2019, as such a change is not correlated with social factors or disciplinary climate. But less efficient practices are likely to limit learning of pupils.

Figure 21 - **Evolución de las prácticas docentes en Matemáticas y Ciencias**

Según los estudiantes en España y Francia



Source: Authors' computations from TIMSS 2019 and 2023 microdata | EsadeEcPol

Two indexes, one for math and one for science are built using contextual questions combined to maximize the explained variance of the math and science scores, after accounting for age, sex and social factors at both the individual and class level. The displayed index is the average of the math and science indexes. Zero is the average in OECD countries and the standard deviation is set to one over the OECD sample.

4.5. Lower and uneven instruction time may be a key enabling factor

More hours of instruction have the potential to increase performance. The cessation of educational activity during the 2020 pandemic has demonstrated that cutting school instruction time can have sizeable adverse impact on student's learning. As schools and education systems adapted, rolling out distance learning for instance, these effects were smoothed out and partially compensated in some instances. Other experiments or policy reforms have shown that changes in the quantity of instruction are indeed followed by changes in performance.[20]

The TIMSS data suggests that heterogeneity in the application of instruction time norms may be detrimental to learning. The TIMSS data at the school level may not be appropriate to investigate the causal impact of instruction time on students' performance. In many countries, hours of instruction reported by principals do differ significantly from one school to another, even if there are official norms that all should comply with. Such differences are hard to interpret. It is plausible that instruction time in a school could be correlated with students' abilities. But the direction of the effect may differ. In some countries more proficient students may be granted more hours to take advantage of their abilities. In other countries, low-proficiency students may benefit for additional remedial courses. Both policies can be enacted at the same time. At the national level however, one could expect to observe a relationship between LQI and the number of hours of instruction prescribed by national curriculum: however, such a link is not apparent in the TIMSS data. LQI is nevertheless clearly lower in countries where the hours of instruction are more heterogeneous across schools, see Figure 23. Here as well causality is difficult to assess, but this still suggests that disparities in hours of instruction within an education system is harming average performance.

Between-school inequalities in hours of instruction are larger in Spain than in a typical OECD country, revealing an inefficiency gap across schools. Although the national law clearly prescribes 875 hours of instruction a year, the average number reported by principals surveyed by TIMSS of 906 hours. But these amounts vary widely from one school to another; provided resources are distributed according to transparent and equal rules, it seems implementation of hours of instruction is unequal, revealing an inefficiency gap across schools. In practice, 40% of Spanish students receive 800 hours or less a year, while 20% have more than 1,030 hours. The workload of the top 10% is very large, above 1,400 hours a year. It is hard to believe that such inequalities would not have any impact on student's performance. Another interpretation of the phenomenon would be that high inequalities in hours of instruction is an indication that the enforcement of the official curriculum across the country is too lax. This would call for clearer and more ambitious guidelines on what content should be taught to all children.

Many French students may not have enough hours or days of school. Inequalities in instruction time are less of a concern in France but half of pupils still receive less hours than the official norm, which is 792 hours. Such a small workload can be seen in a handful of other OECD countries, but France is the only country where pupils go to school only 4 days a week. This reduced number of school days, 144 in theory[21], is likely weighing on what we define as learning quality. As noted before, there is no clear relationship between the total number of instructions hours per year and quality of systems. But, as

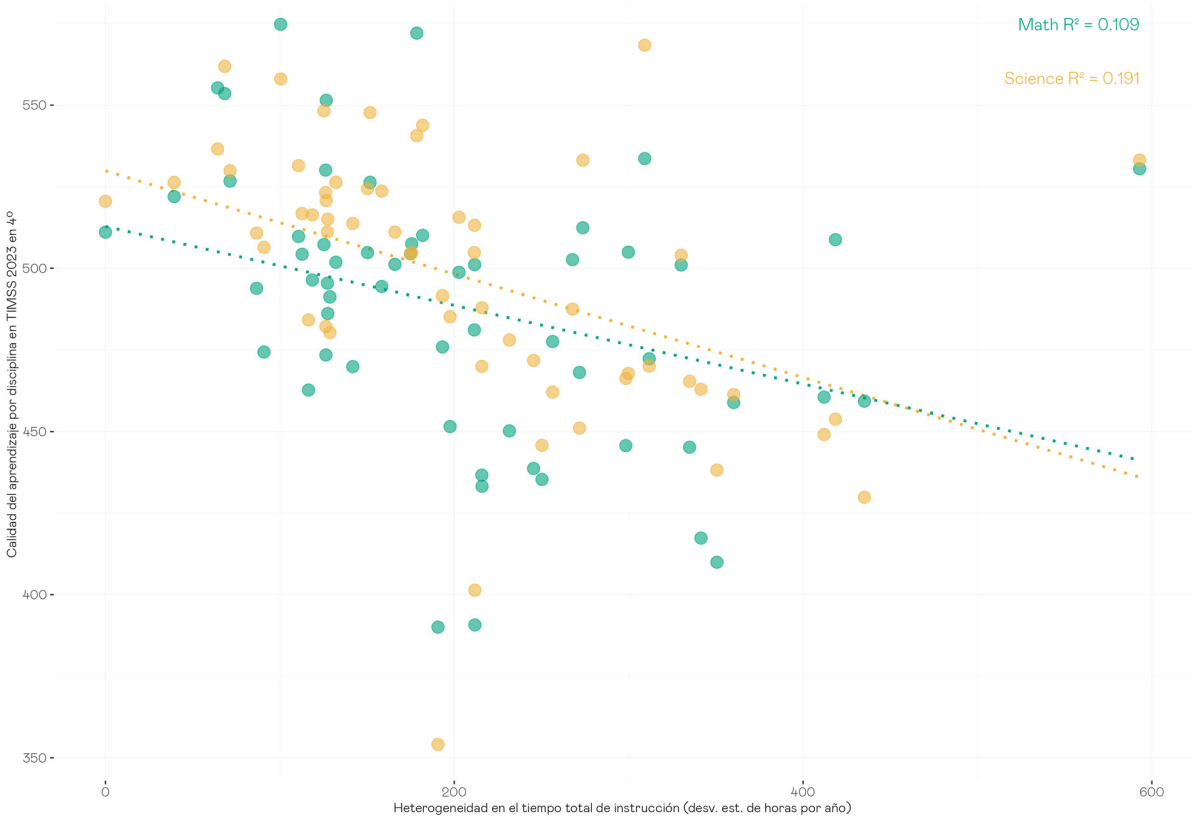
20. See Lavy (2015), Figlio (2018), Bellei (2009), Engzell, Frey, Verhagen (2021) or Thompson (2021).
21. The number of school days is reduced in most years because the Ministry grants additional days off to prolong weekends in May between public holidays on the 1st, 8th, Ascension Day and Pentecost.

Figure 23 shows, pupils who go to school less than 170 days a year, lose on average about 3 points, all other things considered[22].

A proper investigation of the impact of instruction time is overdue. Both the Spanish and French Primary education systems are underperforming, and they both feature important inequalities in hours of instruction. French pupils also have the lowest number of days of instruction per year in TIMSS. Moreover, French PIRLS literacy scores dropped when the country first shifted to a 4-days week in 2008; the country moved back up after a temporary return to a 4.5-day week in 2013 and went down again after reverting to the 4 days week in 2017 (see Figure 24). Furthermore, pupils in French private schools tend to have more hours and days of instructions than in public schools, which are more often sticking to the 144 days calendar. Instruction time is indeed one of the few observable differences between the public and the private system and official test underscore that pupils in private school overperform their peers in public one. All these coincidences are not clear proof of a causal link between hours of instruction and student's performance, but they suggest that heterogeneity and inefficiencies in the way instruction is organized may have a detrimental impact on learning. Further investigation of this topic is needed using controlled experiments to properly determine potential benefits before large-scale reforms.

Figure 22 - **Heterogeneity in total instruction time and learning quality**

Math and Sciences at the national level in TIMSS 2023



Source: Authors' calculations from TIMSS 2023 microdata at grade 4 | EsadeEcPol

Learning quality is the average national score in each discipline after correction of the social factors. The standard deviation of the number of hours of instruction per year is used as the measure of heterogeneity.

22. As witnessed by a mixed model accounting for social factors, school factors and country fixed effects.

5. Four ideas to boost Math and Science learning in Primary in Spain and France

Improving Quality of Learning in Primary in Spain and France education systems could have a long-term impact for all students before they leave school. Learning performance in Math and Science at different levels of education in Spain and France seem unequal. Shortages in foundational skills in the early year are limiting learning down the road up to the end of compulsory education. If what we defined as the "Learning Quality Index" (LQI) for math and science in Primary education could be improved, skills at the age of 15, as measured by PISA scores for instance, would be probably upscaled, as shown in this brief, resulting in larger long term economic and societal gains. Academic performance in France would be above the best EU countries if the quality in Primary was as good as in the typical OECD country. Similarly, PISA scores in Spain would be close to the best EU countries if the country's Primary system would be in line with OECD countries.

While teachers, parents and students seem ready to teach and to learn, Math and Science learning in Primary is lower than one would expect. Data from parental and teacher surveys, as well as Secondary data sources, display a structure in which teachers seem reasonably equipped with the right cognitive skills (except for Spanish Primary teachers, which are just on par with tertiary education graduates); students are socially integrated in schools and parents have medium (France) to high (Spain) expectations on their learning. But it seems that the education system lacks the necessary of ambition to get students thrive in learning, especially to what it is related to enlarge the proportion of top students. A series of hypothesis arise, including the structure of the curriculum, teacher knowledge and pedagogic skills in math, teacher training and preparedness to teach in academically diverse context, or a potentially inefficient use of resources.

Although the education literature has tried to differentiate what international evaluations measure, we show that TIMSS Primary exam is really capturing a key enabler of later results in Secondary in both TIMSS and PISA. Although much of the literature has tried to establish a differentiation of what TIMSS measures (relative to PISA) and that systems can perform different in Primary and Secondary (like France and Spain do), our results show bring a nuanced set of results based on the measure of LQI constructed which reveal the predictive power of TIMSS results in primary. Data analyzed in this brief show a very high cross-country correlation between TIMSS results of LQI in Primary with respect to TIMSS Secondary (four years later) and, similarly, a high correlation between LQI in TIMSS Secondary results with LQI in PISA. Thus, from an education system analysis perspective, such results have to be taken into serious consideration; it is clear that improving academic results in Primary will lead to better results in Secondary in a very similar share.

Since 2019, both countries (especially Spain) have witnessed a large social impoverishment, especially child malnutrition, which explains most of the decline in outcomes and learning conditions. A combination of migration increase and social impoverishment is inducing a perfect

storm of social conditions for students to learn. The number of children in Primary experiencing malnutrition has risen rapidly since 2019 considerably. In Spain, increased migration as well as regional policies on language of instruction set this country as one with the largest proportions (almost 1/3) of students with a language at home different from the language of instruction. Basic goods at home that are key for learning are declining. This in turn affects classroom learning climate as well as teaching practices. This social transformation explains by itself the decline in learning outcomes in TIMSS observed in 2023 in both countries.

The French and Spanish Primary systems share many similarities, but some differences explain the gap in quality of the two systems. During the 20th century Spanish system built its organization, culture and curriculum inspired in the French model. But their differences underline what France could do to progress toward closing the gap with other OECD countries. The Spanish Primary school is less unfair than the French regarding math skills acquisition; children are happier at school; teachers display better pedagogic skills while parents' trust in the system is reflected in their higher expectations. These advantages logically explain that Spanish pupils do perform significantly higher than French ones in Primary. Therefore, France should be able to bridge the gap with Spain and other OECD countries by catching up with Spain on all these dimensions.

More hours of instruction could help with learning, especially in France. Most of the high-performing countries, either in Europe or in Asia are characterized by two features: a higher number of teaching hours, close to 1,000 a year, and rather low inequalities between schools regarding numbers of instruction. But in France, the number of hours of instruction is rather low, below 800 hours a year, about 20% less than in England. In Spain, the number of hours is higher, close to 900, but differences between schools are particularly large and could hurt performance. It is to be noted that although differences in hours of instruction may be fueling inequalities, although there is no apparent link between socioeconomic background and hours of instruction, either in Spain or France.

Starting a path of improvement math and science learning in Primary should be a core priority for both France and Spain and would require structural types of adjustments regarding foundational skill acquisition. The striking similarity between both systems is that the overall academic ambition and incentives to improve are low, especially for the brightest and socially most favored children, which end up progressing faster in obtaining diplomas but not skills. In both countries, teachers do have reasonably good academic skills, but historical roots and curricular policies seem to be pushing them to use a one-size-fits-all approach. Such approach is less effective as children become more challenging and more diverse, which is what is happening to schools as of now. It is a strategy that also harms low-income students as they transition to Secondary, when the system penalizes them through repetition and dropout.

For this, we propose three long-term avenues of action, which will take years of implementation before seeing tangible results:

- **Improving learning conditions by addressing the social impoverishment of learners in the last years.** This requires various layers of action addressing the social crisis under which both Spanish and French Primary learners are experiencing. This should start with: (i) widespread,

free and well-funded breakfast and lunch programs in a much more decided way for a larger share of students; (ii) address the worsening of socio-emotional indicators by increasing the investment in care and psychological experts in schools; (iii) explore policy strategies to support and accompany the growing gap between language of instruction and language at home, especially Spain, due to migration but also language policies in some regions, which may harm students' learning in Primary especially when the language distance is larger (Chiswkick et al, 2005); (iv) develop social programmes to improve living conditions (especially housing) and minimum income schemes for leaners to learn at home.

→ **Simplifying and raising learning standards setting an ambitious and truly applicable curriculum for teachers.** It is imperative to modify the secular approach for excessive content by a more profound learning of basic skills which can enable deep foundational skills, including mathematics. Recent curricular reforms have reproduced past errors through large government decrees which do not practically unpack learning goals and provide teachers with practical examples of how to teach to reach specific goals. A good example is the Australian Curriculum website, created by the Australian Curriculum, Assessment and Reporting Agency (ACARA). ACARA created a hands-on website for teachers which is under constant review, and is made up of courses, subjects, general capabilities (or competencies, very similar to the 8 basic competencies of the EU) and transversal priorities. Each user can find examples for each combination of course, subject, competency and transversal priorities, providing much greater coherence, collaboration and interdisciplinarity in the development of competencies. For each combination, standards are defined (satisfactory, more than satisfactory, unsatisfactory) through concrete examples of tasks, exercises and examples of explanations. In Spain, the 2020 national law (LOMLOE) mandated the creation of a curricular agency in charge of the curriculum development, which has not yet been created.

→ **Deploy practical in-service training to teach foundational skills in diverse and complex social contexts.** Teachers do display good cognitive skills (except for Primary teacher sin Spain) but seem to be facing difficulties to manage classrooms and generate interest in students, according to TIMSS data, but also past data from TALIS 2018[23]. At the same time, training supply is fragmented into many objectives and has left apart key priorities. It is imperative to support teachers by putting in place massive scaled-up in-service training and deploy incentives so that teachers will be able to differentiate their pedagogy within their classroom, catering for the specific needs of a large diversity of students. Similarly, teacher pedagogic skills to transfer mathematical knowledge seems to be a challenge.

→ **Boost investment in targeted support and remedial programs in Primary to ensure that no child is left behind.** This brief shows that class size in France and Spain is at reasonable levels compared to top math and science "quality-of-learning" countries in TIMSS, although it has slightly increased in the last years. Acting early for math skills is critical: a recent longitudinal study with census data from Catalonia showed that the learning deficits appeared

23. In Talis 2018, Spanish and French teachers displayed larger difficulties to teach in multi-level groups. For more information see Gortazar (2025).

in Primary did not turn over once those children reached Secondary, with 90% of students with low math results continuing having low results in Secondary (Alegre and Morató, 2023). Reducing class size may be necessary in the short term but will only have an impact in a limited number of schools with a disproportionate number of socially vulnerable learners. And while technological solutions make a lot of sense for personalization and learning efficiency, its usage in the early Primary grades as a core strategy may entail larger risks regarding screen addiction and student wellbeing. As such, investments in early Primary need by no means a boost in larger targeted financing for intensive and small-group literacy and numeracy skill development every day, as did the English education systems since the late 90s[24]. A large and clear scientific body of research states that small-group tutoring is a cost-effective intervention when applied in high dosage and in very small groups: but with limited budget, the political economy of such reforms ends up turning available budget into diluted investments that prioritize quantity of students to quality of programs.

24. See https://publications.parliament.uk/pa/cm200405/cmselect/cmeduski/121/12105.htm?utm_source=chatgpt.com

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