Chapter 17
International Large-Scale Assessments: Trends and Effects on the Portuguese Public Education System

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Portugal's first major participation on an international large-scale student assessment (ILSA) was with TIMSS 1995. Portuguese students performed very poorly, and this led to the dismissal of TIMSS as a valid assessment for the Portuguese education system and the devaluation of the results. However, participation in TIMSS 1995 set in motion a sample-based external assessment in mathematics the following year whose framework was clearly inspired by TIMSS and which set the reference for the external assessments that still prevail today. The PISA 2000 survey that followed found the Portuguese students in the lowest rankings amongst the OECD countries. The TIMSS and PISA results reinforced the perception that the Portuguese curricula, teaching and assessment practices needed much improvement. ILSA and OECD suggestions were used to support and justify education policies aimed at the curricula reformulation, teaching practices, students' support programs and schools' management. In 2015, Portugal ranked for the first time above the OECD PISA average. This chapter gives a brief overview of the Portuguese record in major ILSAs and their effects on the shaping of the Portuguese educational system.

The Portuguese Education System

Universal education in Portugal has a long tradition that goes back to the early nineteenth century with the publication of the Constitutional Bill of Civil Rights that determined free primary education – focused on reading, writing, and mathematical calculations – for all Portuguese citizens (Mendonça n.d.). Up to 1910, education in Portugal was primarily provided by religious orders, namely, the

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Jesuits. The implementation of the Republic in October of that year overthrew the monarchy and brought the expulsion of the religious orders from Portugal and the first reform of the Portuguese education system (MEC-OEI 2003; Mendonça n.d.). Concerned with the decline of the Portuguese school system, the high illiteracy rates – about 70% of the population – and its lag in relation to most European countries, the first Republic's government set a phased large reform programme for the various levels of education (MEC-OEI 2003). Key educators of that time, like João de Deus, led the reform of the primary education system, emphasizing the importance of reading literacy at early ages (Candeias et al. 2007; MEC-OEI 2003; Mendonça n.d.)

With the military revolution of 1926 that opened the door to the fascist regime that followed, education reforms succeeded mainly with an emphasis on ideological nationalism. During the 1950s, illiteracy rates were still high – about 40% – and the Portuguese education system, under the nationalist order, was mainly devoted to its internal borders and African colonies (MEC-OEI 2003). Again, recognition of the education gap in comparison with post–world war II European countries led the government to request assistance from the Organization for Economic Cooperation and Development (OECD) in 1955. The Mediterranean Regional Project, under the sponsorship of the OECD, marks the first attempt at alignment with the international education framework of the twentieth century (Alves 2012; Mendonça n.d.). Compulsory schooling was expanded to 4 years in the following year, although only for boys. Four years of mandatory schools for girls only arrived in 1960 (MEC-OEI 2003). Still, training of human resources was mostly ideological, valuing the nationalist ideology and the associated social promotion in cities, while the rural areas were lacking fully trained primary school teachers. The late 1950s saw an effort of the country's industrialization and the shift of rural populations to the big cities, exchanging farms for factories. The first report on the OECD's Mediterranean Project, released in 1964, pointed to the much-needed reform of the education system to answer the economy's dynamic requests (Alves 2012). In 1966, mandatory schooling for both sexes was extended to 6 years, and the first pedagogical research institute was created. Children who could not pursue their studies would do the 6 mandatory years, while those that were set to pursue further education, mainly determined by the socioeconomic status of their families, had to pass a national exam at the end of grade 4 before they could proceed to the lycées or technical education. Higher education was the logical end of the lycées, but only a small proportion of students at that time would pursue higher education. Professional/vocational training was the major concern of the state (MEC-OEI 2003).

At about the same time, the International Association for the Evaluation of Educational Achievement (IEA) was founded. In 1960, IEA deployed the first large-scale comparative educational assessment in 12 countries (the 'Pilot Twelve-Country Study'). During this and the following decades, IEA set much of the analytical framework for content assessment, student sampling, proficiency estimation and data analysis of international large-scale cross-national student assessments (ILSA). Since then, IEA has conducted ILSAs on mathematics, science and

reading literacy (e.g. FIMS, First International Mathematics Study in 1964 and FISS, First International Science Study in 1970–1971 preceded the 1995 TIMSS, Trends in International Math and Science Study) (IEA 2018).

Portugal – still under the 'new state' fascist regime – kept back facing the rest of Europe. It was only in the early 1970s that the minister of education Veiga Simão set the political context for the first large and profound reform of the Portuguese basic, secondary and higher education systems (MEC-OEI 2003). However, Simão's reform was never implemented since on 25 April 1974, a military coupe ended the 40-year-long fascist regime and set the country back to democracy. Despite the strong ideological and social conflicts that followed the revolution years, the importance of education on the country's social and economic development was consensual amongst all ideological parties and society strata (Alves 2012). Major changes led by the revolutionary spirit happened in those years. In 1975, the grade 4 exam was abolished, and students could not be retained anymore at grades 1 and 3. Mandatory schooling was extended to 9 years, and a major reorganization of schooling cycles and curricula occurred with the intent of increasing attendance of students, especially those from disadvantaged families, in primary education and lower secondary education (MEC-OEI 2003). The lycée and professional tracks were fused with a common core for grades 7 and 8, and students following the professional track were given access to higher education. Many professional schools were converted into university institutes which, like the classical universities, enjoyed renewed pedagogic, scientific and administrative autonomy. During the on-course revolution years, secondary education was completed with a civic year – where students worked to the benefit of their communities – preceding enrolment in higher education. In 1980 this civic year was replaced by grade 12 with the dual objective of being the terminal year for secondary education and the interim year for admission to higher education. Grade 12 had a dual pathway granting access to either the traditional 5-year sciences and humanities higher education degree or the professional oriented 3-year polytechnic higher education (MEC-OEI 2003). The harsh economic times of the 1980s and the need for skilled workers for the development of the fragile economy set the stage for basic and secondary education reform defined by 1986's 'Basis Law of the Educational System'. This law consigns that the right to education and culture for all children is 9 years of compulsory schooling, ensuring the training required for active participation in society, equality of opportunities, freedom of learning and teaching and the training of all young people and adults who had dropped school. Vocational and professional secondary courses that granted access to a profession or the pursuit of higher education were reformed in parallel with the regular sciences and humanities tracks. The basic and education system was organized in four cycles of study – the first cycle (grades 1–4), the second cycle (grades 5 and 6), the third cycle (grades 7–9) and secondary (grades 10–12). High-stake national exams were first introduced at grade 12 in 1994 with the dual purpose of certifying the end of the secondary education and rank students' access to higher education. National high-stake exams at the end of the third cycle of basic education (grade 9) for Portuguese language and mathematics were intro-

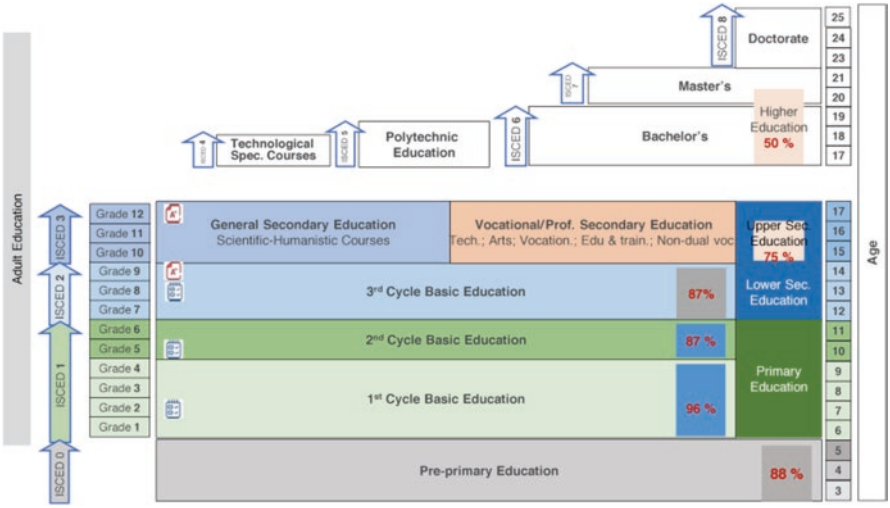

Fig. 17.1 The Portuguese education system (as of 2016). Percentage numbers are the coverage at each education cycle. and represent low-stakes and high-stakes national achievement test at the aligned grades. (Fundação Francisco Manuel dos Santos 2018; Marôco 2016; Ministério da Educação 2007; Organization for the Economic Cooperation and Development 2018)

duced in 2005, and national high-stake exams for Portuguese language and mathematics exams at grade 4 were introduced in 2013 (and revoked 3 years later with the change in government). In 2012, compulsory education was set to 12 years or until 18 years of age. Figure 17.1 summarizes the actual Portuguese education system.

Education policies and reforms in Portugal during the 1990s have been set by ideological agendas and interpretations of what were the best curricula, teaching and learning practices to reach the goals of social, cultural, scientific and economic development. However, little data-driven evidence was presented to support education policy and policy changes. At about the same time, OECD was feeling the need to fill the gap on valid and reliable, regularly collected, educational indicators to evaluate and compare the national education systems of its member countries. Thus, the Programme for International Student Assessment (PISA) was created in 2000 to respond to what OECD claimed to be the lack of quality and coverage of cross-national student achievement data generated by IEA studies started in the 1960s (Breakspear 2014).

Aimed at gathering external data on the Portuguese students' knowledge and skills, Portugal participated in the first edition of TIMSS (1995) but then withdraw from the study until 2011. The next participation of Portugal on an ILSA was in the first cycle of PISA, in 2000. Ever since, the evolution and influence of these international large-scale students' assessments on the educational policies support and need for reforms have been quite substantive as we shall see in the next sections.

International Assessments Today

Following the very poor results obtained by Portuguese students in the 1995 TIMSS edition with grade 4 and grade 8 students, Portugal withdraw from this ILSA because decision makers at that time felt that TIMSS was not a valid measure of the Portuguese students' specific knowledge and skills which were not aligned with the TIMSS curricula framework. It was only in 2011 that Portugal returned to TIMSS and PIRLS (Progress in International Reading Literacy study) for grade 4, participating again in the 2015 TIMSS (grade 4) and TIMSS Advanced (grade 12) editions and in the 2016 PIRLS and ePIRLS (electronic PIRLS). The ninth grade Portuguese students' proficiency with foreign languages (English and French) was assessed in 2011 with the First European Survey on Language Competence (*SurveyLang*) project sponsored by the European Commission. Being an OECD member, Portugal participated in the first PISA cycle (2000) and all other cycles that followed (2003, 2006, 2009, 2015 and 2018). In 2018, Portugal also participated for the first time in the IEA's International Computer Information Literacy Study (ICILS 2018). In 2019, Portugal is set to participate in TIMSS for grade 4 and TIMSS for grade 8. For 2021, participation in the PISA 2021 and PIRLS 2021 is planned, and preparation for these studies has already started. It is worth to note that PISA 2015 and subsequent cycles were done as computer-based assessment. Portugal was also one of the 21 countries that did, in 2017, the computer-based eTIMSS pilot study. TIMSS 2019 and PIRLS 2021 are planned to be delivered in a computer-based (e-assessment) format.

Nowadays, ILSA data is seen by education policy makers as fundamental for the external evaluation of the education system, to benchmark the evolution of the basic and secondary students' knowledge and skills and to support education policies (for a review, see Afonso and Costa 2009; Carvalho et al. 2017). The impact of ILSA results on the education community, policy makers and the public is well illustrated by the media that profusely report the ILSA results obtained by the Portuguese students and commentaries on the results, causes and consequences by education specialists and policy makers alike. In the days and week after the TIMSS 2015 results release (29/11/2016) more than a dozen text, radio and TV reports were published or aired. The same metric was observed for PISA 2015 results (released on 06/12/2016) that were extensively reported by the media in the days and week after the release. The education community, both from teacher training institutes and universities as well as the private sector, has devoted much attention to the ILSA results and secondary data analysis. For example, the Fundação Francisco Manuel dos Santos, a private philanthropic foundation, has sponsored and published secondary analysis of the Portuguese PISA results targeted to the public and educators (Ferreira et al. 2017a, b). The National Education Council, a policy consulting agency to the Ministry of Education, has set a programme of conferences and publications on the ILSA secondary analysis, again targeted mainly for educators and the public (Conselho Nacional de Educação 2013, 2015). However, peer-reviewed research on Portuguese ILSA data published in specialized journals is still scarce. A

recent review by Carvalho et al. (2017) regarding PISA secondary analysis only identified nine research papers, published mainly in economy and management journals, from the 2009–2015 PISA period.

Portugal Performance on the ILSAs

ILSA results in Portugal have been somewhat contradictory. While there was a consistent trend in all three domains of PISA, a feature that had no parallel in the European Union, and in TIMSS mathematics, the same pattern was not observed for TIMSS science and PIRLS reading literacy. Figure 17.2 illustrates the Portuguese results in PISA, TIMSS fourth grade and PIRLS from 1995 to 2016. From the bottom of the table of the OECD countries in the PISA 2000 cycle, Portuguese students have jumped approximately one half of a standard deviation on the PISA scale (that is almost two years of formal schooling) in 15 years. The average growth rate was 1.8 PISA points per year for reading literacy, 2.6 PISA points per year for mathematical literacy and 2.8 PISA points per year for scientific literacy. This is particularly relevant since OECD countries overall, in the same period, showed a negative growth rate of −0.6 PISA points per year for reading literacy, −0.5 PISA points per year for mathematical literacy and −0.3 PISA points per year for scientific literacy (Fig. 17.2.). In the 2015 cycle, Portuguese students ranked significantly above the OECD average for scientific and reading literacy, being on the OECD average for mathematical literacy (Marôco et al. 2016a). For TIMSS and PIRLS, there are only

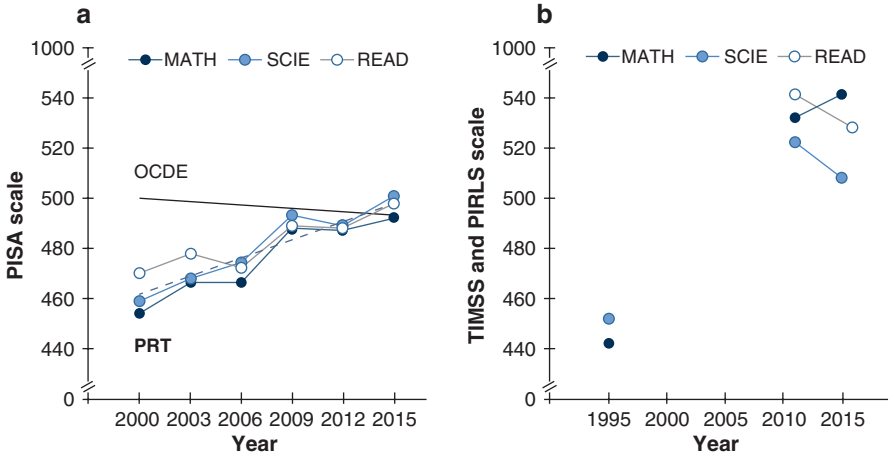

Fig. 17.2 PISA, TIMSS and PIRLS mean score for Portugal from 2000 to 2015 (PISA) and 1995 to 2015–2016 (TIMSS) and 2011 to 2016 (PIRLS). In panel A (PISA), the broken line represents the Portuguese evolution in all three PISA domains (2.4 points/year), while the continuous line represents the OECD mean evolution in the three domains (−0.5 points/year). (Adapted from Marôco et al. 2016a, b)

data for three and two of its cycles, respectively. There was a quite relevant evolution from TIMSS 1995 to TIMSS 2011. However, for 2015 the trend is not clear. While for mathematics at grade 4, the Portuguese students ranked significantly above the international mean score and even got better results than those from countries who are generally pointed to for reference in the ILSA constellation (e.g. Finland), there were statistically significant drops for science (TIMSS) and reading literacy (PIRLS) from the penultimate to the last editions of these studies (Marôco 2018; Marôco et al. 2016b). TIMSS Advanced (for grade 12) results positioned Portugal in the middle of the ranked table of participants, significantly above all the European countries that took part in the TIMSS Advanced mathematics and physics test (Marôco et al. 2016c).

Despite the praised positive evolution, even by OECD's Andreas Schleicher who stated that 'Portugal is Europe's biggest success story in PISA' (Tavares 2017), PISA does reveal some of the fragilities of the Portuguese education system. One of the most striking is the strong regional asymmetries in the PISA results. Early secondary analysis by Pereira and Reis (2012) with PISA 2009 mathematics and reading literacy data revealed statistically significant regional differences with the autonomous region of Madeira, south and interior regions scoring 30–40 points below the national average. Those differences were maintained or even amplified in PISA 2015 (Marôco 2017). The statistically significant lower performing NUTS III regions are still located in the interior, north and autonomous archipelagos regions. The top-performing regions (with average scores significantly above the national mean by more than 10 points) are generally located on the coastal and more developed regions. This pattern, as illustrated by Fig. 17.3 for mathematical literacy results in the 2015 TIMSS and PISA editions, is similar for scientific and reading literacies (data not shown).

Further research, with PISA 2015 scientific literacy data using with hierarchical linear modelling with regions as clusters, revealed that the epistemic beliefs in

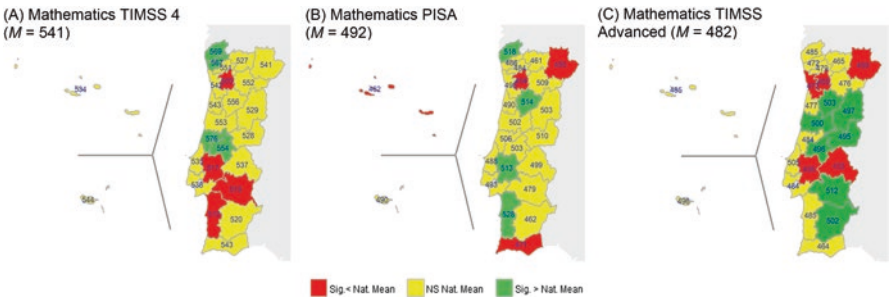

Fig. 17.3 Regional scores for mathematical literacy at (**a**) TIMSS 4 2015 [grade 4], (**b**) PISA 2015 [grades 7–11, with 20% and 57% of PISA students at grades 9 and 10, respectively] and (**c**) TIMSS Advanced 2015 [grade 12]. Dark red indicates regions with mean scores statistically significantly below the national average, yellow indicates regions with mean scores not statistically different from the national mean (NS), and green indicates regions with mean scores statistically significantly above the national average (M) for $p < 0.05$. (Marôco et al. 2016a, b, c)

science ($\beta = 0.27$, $p < 0.05$), the expected occupational status by age 30 (BSMJ; $\beta = 0.26$, $p < 0.05$) and the economic and sociocultural status (ESCS; $\beta = 0.23$, $p < 0.05$) at the student level and the students behaviours hindering learning ($\beta = -0.31$, $p < 0.05$) and class size ($\beta = 0.39$, $p < 0.05$) at the school level were the strongest predictors of the observed regional scores' variation in PISA 2015 (Marôco 2017). A similar analysis for PIRLS 2016 results revealed that the best predictors for reading literacy of Portuguese fourth graders were the confidence as readers ($\beta = 0.31$, $p < 0.05$) and the home resources for learning ($\beta = 0.26$, $p < 0.05$) at the student level. The emphasis of schools on academic success ($\beta = 0.40$, $p < 0.05$) and the desire of students to do well in school ($\beta = 0.31$, $p < 0.05$) were the best predictors of reading literacy at the school and teacher levels (Marôco 2018).

Concerns regarding the validity of ILSAs to assess the Portuguese students' knowledge and skills have been verbalized both by policy makers and the media (Cristo 2017). ILSAs, like PISA or TIMSS and PIRLS, are generally presented as reliable transnational instruments to benchmark the performance of education systems and facilitate education reforms (Breakspear 2012; Carvalho 2012; Nelson 2002; Phillips and Jiang 2015). However, criticisms have been drawn on these ILSA uses due to the lack of transcultural invariance (Rutkowski and Svetina 2014) and lack of evidence of the external validity of the ILSA as regarded to their driven education policies change (Hanberger 2014) and reliability and criterion validity (Schult and Sparfeldt 2016). At the present date, to the best of my knowledge, there is but one available report on the concurrent validity of ILSA estimated literacies and countries' national assessments: APavešić and Cankar (2018) observed a 0.7 correlation between TIMSS Advanced mathematics and the mathematics natura exam in Slovenia in 2015. Although national assessments, like high-stake certification and graduation exams, have different objectives from the low-stake ILSA, assessed domains are, in different degrees, shared, and thus concurrent validity should be observed. Using the mathematical literacy as an example, we conducted a national vs. ILSA tests content and correlation analysis of the national high-stake mathematics exams scores with mathematical literacies evaluated by TIMSS at grades 4 and 12 and PISA at grades 9 and 10 (Marôco and Lourenço 2017). Table 17.1 summarizes the common features of the 2015 Portuguese national high-stake exams and the TIMSS fourth grade, PISA and TIMSS Advanced content and cognitive domains. The content domains of the national high-stake exams are better aligned with the TIMSS fourth grade and TIMSS Advanced and somewhat less with PISA. This is easily explained by the class/curriculum-based TIMSS as compared to the age-based PISA, as well as the policy changes to better align the national curricula with the TIMSS frameworks. Analysis of the national high-stake exams results of students that participated on the 2015 cycles of TIMSS and PISA found moderate to strong correlations between the scores of ILSA's mathematical literacies and the national mathematics exams (Fig. 17.4). The observed correlations were higher for TIMSS fourth grade and TIMSS Advanced ($r = 0.71 \pm 0.01$, $p < 0.001$) than for PISA ($r = 0.63 \pm 0.01$, $p < 0.001$). It is worthwhile to mention that the magnitudes of these correlations were similar to the correlations between

Table 17.1 Content analysis of the Portuguese mathematics national exams for grades 4, 9 and 12 during the 2014/2015 school year (first phase) and the mathematics literacy tests of TIMSS grade 4, PISA and TIMSS Advanced (2015 editions) (Marôco and Lourenço 2017)

Domains	ILSA mathematics (%)	National mathematics exam (%)
	2015 TIMSS grade 4	Grade 4 (2014/2015)
Content domains		
Numbers	50	44
Geometric shapes and measures	35	43
Data display	15	13
Cognitive domains		
Knowing	40	43
Applying	40	36
Reasoning	20	21
	2015 PISA	Grade 9 (2014/2015)
Content domains		
Quantity	25	12
Space and shape	25	40
Change and relationships	25	35
Uncertainty and data	25	13
Cognitive domains		
Knowing	–	37
Formulating	25	–
Applying	50	38
Interpreting/reasoning	25	2
	2015 TIMSS Advanced	Grade 12 (2014/2015)
Content domains		
Algebra	35	20
Calculus	35	32
Geometry	29	27
Probability and combinatorics	–	20
Cognitive domains		
Knowing	29	23
Applying	41	57
Reasoning	30	20

the sampled students' final mathematics score (assigned by teachers) and their score on the national exams (r = 0.68 for grade 4; r = 0.62 for grade 9; r = 0.77 for grade 12).

It is noticeable that despite the economic crisis of the 2008–2013 period when national GDP was reduced by 8% (Perez and Matsaganis 2018), Portugal was still able to increase its overall PISA score, ranking in the 2015 edition, for the first time, above the OECD average for scientific, reading literacies. Ferreira et al. (2017a) did a comparative study of the PISA results from 2000 to 2015 and identified, as follows, the principal positive and negative features that explain Portugal's evolution in PISA. Although Portugal is a relatively poor country as compared to

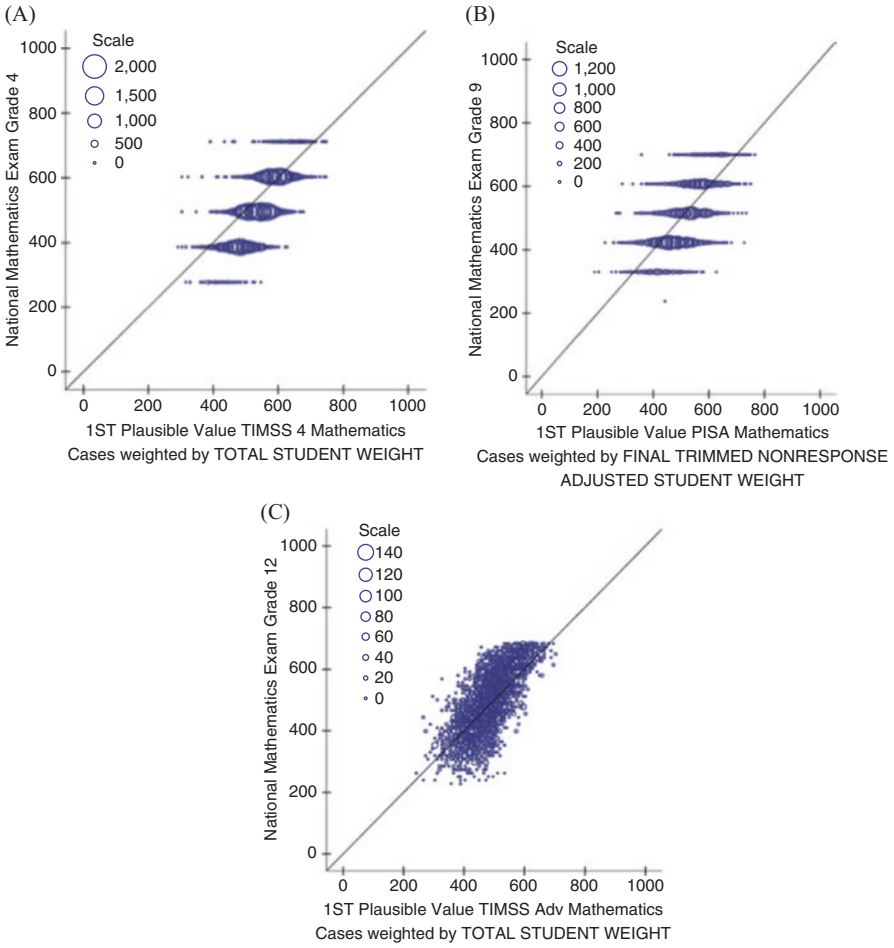

Fig. 17.4 Concurrent validity of the national mathematics exams at grades 4, 9 and 12 and the TIMSS grade 4 (**a**), PISA (**b**) and TIMSS Advanced (**c**) mathematics literacies (first plausible value). National exam scores for grades 4 and 9 range from 1 to 5. Scores for grade 12 range from 0 to 20. National exam scores were converted to the TIMSS and PISA scale (M = 500, SD = 100) before correlation analysis. (Marôco and Lourenço 2017)

other OECD members (the 2015 GDP per capita for Portugal was 29.5 kUSD vs. 41.1 kUSD for the OECD mean (OECD.Stat n.d.), the expenditure in education per capita is in line with other OECD member states. Pre-school coverage is close to 100%; teachers have appropriate specific and pedagogical training and feel they can make a change in students' lives. Students are motivated and persistent and feel supported by their parents and teachers. Thirty percent of schools in less favoured economic regions have better results than what would be expected by their ESCS. These results were attributed to teachers' competence, motivation and openness towards change, students' engagement and discipline and schools'

educational projects aligned with the community. However, there is still much need for improvement in the Portuguese education system, namely, on the reduction of grade retention rates, increase in parental education, renewal of aging teachers and improvement in schools' autonomy, especially as far as teacher recruitment is concerned (Ferreira et al. 2017a).

Impacts of ILSAs on the Portuguese Education System

TIMSS 1995 showed that Portuguese students were significantly behind the students in the Western countries that took the test. According to the education policy makers in office during that period (1995–2000), these poor results were attributed to the maladjustment of the curricula and typology of the TIMSS test to the Portuguese education system (Barroso 2010). This undisputed perception of the negative TIMSS results and its validity for the national context were used as a pretext to delay the discussion on the national curricula, to analyse the TIMSS results and to promote their dissemination and discussion (Barroso 2010; Carvalho et al. 2017). However, and despite the devaluation of TIMSS, the Institute for Educational Innovation, which was responsible for the TIMSS 1995 application in Portugal, started in 1996 a national, sample-based, diagnostic test of mathematics whose conceptual inspiration came clearly from the TIMSS 1995 framework (Amaro 1997; Barroso 2010). Results from TIMSS 1995 raised the awareness of the need for the external assessment of students. This was explicitly recognized with the creation, in 1997, of the Office for Educational Evaluation (GAVE), a central office of the Ministry of Education, whose responsibilities were for the planning, coordination, creation and validation of external learning assessment instruments, as well as the coordination of future participation in ILSAs (Justino and de Almeida 2017). In 2013, the GAVE responsibilities were passed on to the Institute for Educational Evaluation (IAVE), a public institute with scientific and administrative autonomy under the supervision of the Ministry of Education. The influence of the TIMSS and PISA frameworks on the national basic and secondary exams as well as the importance of the external assessments, both low and high stakes, driven by earlier ILSA participation, still prevails in the Portuguese education system.

Other than the gains in methodological and external assessment practices, no real or significant perceived educational policy consequences were driven from the Portuguese participation in the ILSA during the 1991–2003 period (Fernandes 2014; Fernandes and Gonçalves 2018). It is in the first decade of the twenty-first century, specially from 2005 on, that the education policy discourse included explicit references to PISA results (Carvalho et al. 2017). Before this date, PISA reports have been evoked only twice: to support the reorganization of the basic and secondary education curricula in 2001 by the education minister Julio Pedrosa following the PISA 2000 results and, in 2004, during a Parliament session, when the minister of education Carmo Seabra quotes the 2003 PISA results to prioritize the

learning of the Portuguese language, mathematics and science in the national curricula (Afonso and Costa 2009). The next education minister, Maria de Lurdes Rodrigues (2005–2009), explicitly used the PISA results, in line with the national low-stakes test results, to promote data-driven policy measures (Afonso and Costa 2009; Carvalho et al. 2017; Fernandes and Gonçalves 2018). The first National Programme for Teaching the Portuguese Language, the National Reading Plan and the Mathematics Action Plan were justified on the basis of the much needed improvement of Portuguese students in the PISA tests, despite the fact that these plans were in line with the educational policies started in the early 1990s (Fernandes 2014; Fernandes and Gonçalves 2018). The reforms made by curricular changes in the first decade of the twenty-first century, inspired by TIMSS and PISA, were accompanied by a strengthening of external assessment of students and schools, namely, with the high-stakes standardized exams for mathematics and Portuguese language at grade 9 promoted by the 2002–2004 minister of education David Justino (Justino and de Almeida 2017). PISA data was also used to support policies aimed at the enlargement of economic support to students from low-income families, facilitate the access to internet and computers for primary education (the 2007 Technological Education Plan), and to reorganize the Priority Intervention Educational Territories (TEIP) Program for schools located in economic depressed areas (Afonso and Costa 2009). Furthermore, under the expertise of the PISA reports on teachers qualifications and professional practices, controversial policies like the teachers' performance assessment and the revision of the qualifications required to become a teacher were proposed during the 2005–2011 period (Afonso and Costa 2009; Carvalho et al. 2017) although some, like the Teachers' Exam of Knowledge and Capacities (PACC), required to land a teaching job, were only later (2014–2015) and, briefly, implemented.

ILSA results and frameworks, namely, PISA and TIMSS, were again recalled in the 2011–2015 period. The education minister Nuno Crato serving during this term explicitly quoted PISA and TIMSS required skills and competencies to further reform and strengthen the mathematics, sciences and Portuguese language curricula and targets, to recommend teaching practices and timetables and to further expand the national high-stakes exams portfolio to grades 4 and 6. The importance of the alignment of the national curricula to the ILSA curricula was recognized in the established national advanced mathematics curriculum that stated: 'analysis of these elements [TIMSS Advanced framework], as well as curricula from other countries not participating in TIMSS Advanced, reveals that the inclusion in the curriculum of some fundamental themes, currently absent from the Secondary Education in Portugal, contributes decisively to the alignment of national curricular options with the international plan (…)' (Bivar et al. 2015). Figure 17.5 summarizes the major ILSA policy drivers in the Portuguese education system aligned with the PISA mathematics literacy score and the national education expenditure.

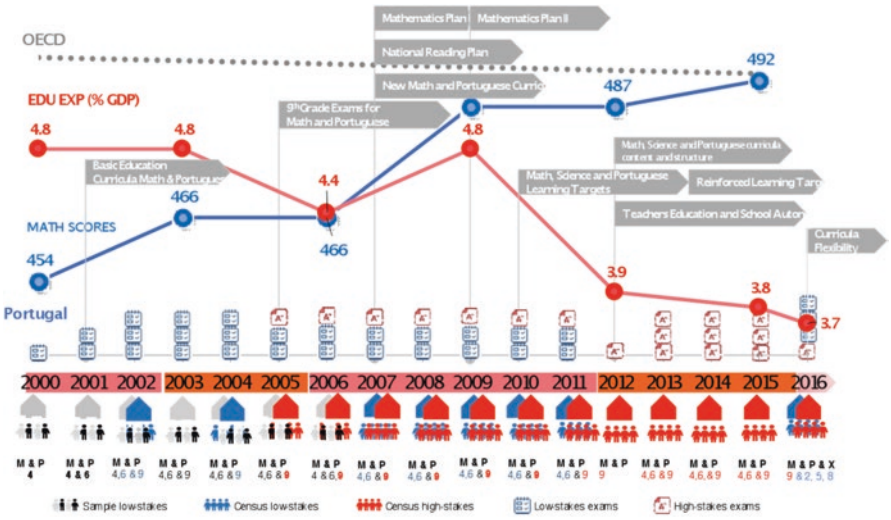

Fig. 17.5 Major ILSA-*driven* education policy and external assessments changes during the PISA timeframe. Pink bars represent socialist governments, orange bars represent social democrats' governments. M stands for mathematics, P stands for Portuguese language, X stands for multiple subjects (geography, history, etc.) at different grades (4, 6, 9, etc.) and EDU EXP stands for educational expenditure, as percentage of the GDP in the PISA years. (Adapted from Ministério da Educação e Ciência 2015 and references in the text)

Concluding Remarks

My analysis shows that ILSA results in Portugal give valid and reliable indicators of the Portuguese national education system performance per comparison to international frameworks. Trends for Portuguese students' performance can be inferred from participation in ILSA. This feature of ILSA compensates for the limitation of the Portuguese national exams system, which, being public, doesn't have trend items that could be used to build trends. ILSA has also been used to build knowledge on both large-scale assessments and best practices for standardized testing. The Portuguese education reforms were, from the early years of the twentieth century to the present day, driven by the recognition of the system's deficiencies as compared with other European countries. International diagnostics, done by organizations like the OECD, and results from early participation in ILSA in the late twentieth century have set the stage for educational policy change and to support system-wide interventions, reshaping the Portuguese education landscape in the twenty-first century.

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