

Unclassified

ECO/WKP(2009)68

Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development

12-Oct-2009

English - Or. English

ECONOMICS DEPARTMENT

ECO/WKP(2009)68
Unclassified

TOWARDS BETTER SCHOOLS AND MORE EQUAL OPPORTUNITIES FOR LEARNING IN ITALY
ECONOMICS DEPARTMENT WORKING PAPER No. 727

By Romina Boarini

All Economics Department Working Papers are available through the OECD internet website at
www.oecd.org/Working_Papers

JT03271587

Document complet disponible sur OLIS dans son format d'origine
Complete document available on OLIS in its original format

English - Or. English

ABSTRACT/RESUMÉ

Towards better schools and more equal opportunities for learning in Italy

Compulsory school education in Italy produces poor results in terms of 15-year olds' performance on PISA tests, compared with other OECD countries, despite a relatively high level of expenditure. While the influence of social background is smaller than in many OECD countries, it is largely transmitted through a kind of self-segregation resulting from family choices among the different types of upper secondary school. Large differences in pupils' performance between regions cannot be explained by the quantity of resources available; separating the influence of socio-economic conditions from school efficiency is difficult and must be treated carefully in plans for extending fiscal federalism. The Italian government is rightly concerned to get better value for money and this chapter argues that policies to improve the information available to schools and teachers on the results they are achieving, while giving them appropriate incentives, responsibility and power to respond to such information, are necessary accompaniments to expenditure-saving policies. An improved focus on good quality training, both for new recruits and experienced teachers, and recruitment procedures themselves, should also pay dividends on efficiency.

This Working Paper relates to the 2009 Economic Survey of Italy.

(www.oecd.org/eco/surveys/Italy)

JEL classification :I21; I28

Key words : education; school outcomes; Italy; PISA data; fiscal federalism

Améliorer l'école et l'égalité d'accès à l'éducation en Italie

Par rapport aux autres pays de l'OCDE, les résultats des tests PISA des élèves italiens de 15 ans sont médiocres, et ce, malgré des dépenses d'éducation relativement élevées. Si l'incidence du milieu social est moindre que dans de nombreux autres pays membres, elle passe essentiellement par une sorte d'auto-discrimination résultant du choix des familles entre les différents types d'établissements secondaires du deuxième cycle. L'importance des écarts de résultats scolaires entre les régions ne peut s'expliquer par le volume des ressources disponibles. Il est difficile de faire la distinction entre l'impact des conditions socio-économiques et l'efficacité des établissements, et cela doit être étudié avec soin dans le cadre des projets d'extension du fédéralisme fiscal. Le gouvernement italien souhaite, à juste titre, optimiser les dépenses publiques et le présent chapitre défend l'idée selon laquelle des mesures visant à améliorer les informations à disposition des établissements scolaires et des enseignants concernant leurs résultats – tout en leur apportant les incitations, les responsabilités et les pouvoirs nécessaires pour agir en fonction de ces résultats – doivent accompagner les mesures d'économies budgétaires. Une attention plus grande accordée à une formation de qualité pour les enseignants, qu'il s'agisse des nouvelles recrues comme des enseignants chevronnés, ainsi qu'aux procédures de recrutement elles-mêmes, devrait également favoriser l'efficacité.

Ce document de travail se rapporte à l'*Etude économique de l'OCDE de l'Italie 2009*.

(www.oecd.org/eco/surveys/Italie)

Classification JEL :I21; I28

Mots clés : éducation ; résultats scolaires ; Italie ; PISA ; fédéralisme fiscal

Copyright OECD 2009

**Application for permission to reproduce or translate all, or part of, this material should be made to:
Head of Publications Service, OECD, 2 rue André-Pascal, 75775 Paris cedex 16, France.**

TABLE OF CONTENTS

Towards better schools and more equal opportunities for learning in Italy	5
The main challenges facing Italian education.....	5
Enhancing school results.....	6
Reducing regional disparities in learning outcomes.....	6
Reducing inequality in education outcomes.....	9
Raising cost efficiency	9
Managing regional diversity and fiscal federalism	11
Improving the transition from secondary to tertiary education and the labour market	14
A comprehensive reform is needed to take up all the challenges.....	14
Containing spending in primary and secondary education	18
Trends of spending per student in primary and secondary education and main determinants.....	18
Why does Italy have more teachers per student?	19
The main drivers of educational outcomes	22
Autonomy and accountability of schools should be increased across the country.....	23
Regional variation and weak vocational education: treat results with care.....	26
Specific policies may be needed for low-performing schools.....	27
Introducing schools' incentives to performance	28
The lack of evaluation hinders performance	28
Improving teaching quality	32
Composition of the Italian teaching workforce and the link with teaching quality	32
A relatively low-profile profession... ..	33
...with weak recruitment procedures	35
Low incentives to keep up motivation and skill updating.....	36
How should teachers be evaluated?.....	37
What consequences should be attached to teachers' evaluation?.....	38
<i>The importance of school leadership</i>	38
The political economy of educational reforms: lessons for Italy?	39
Improving transition from upper-secondary school to the labour market and tertiary education.....	41
Too many early school leavers and difficult entry into the labour market.....	41
Conclusions.....	42
Bibliography	45
<i>Annex 1.A1</i> The determinants of PISA scores: the cross-country perspective and a study of drivers of disparities across Italian regions.....	50
1. Empirical analysis of educational outcomes: methodological background and findings from the literature	50
2. Econometric analysis of PISA 2006 scores: cross-country and within-country empirical strategy	51
3. Data sources.....	51
4. Main results from cross-country regressions	54
5. Main results from within country regression	57
6. Discussion and caveats	61

Tables

1. Education expenditure in Italy	18
2. Determinants of teacher per student ratio Italy	19
3. Italy has few school or pupil evaluation tools.....	29
4. Teachers in Italy are not subject to any kind of evaluation.....	36
1.A1.1. Descriptive statistics of the variables used in the empirical model.....	53

Figures

1. Italy has below-average PISA scores.....	7
2. Strong disparities in educational outcomes across regions.....	8
3. Social segregation between schools may hinder social mobility later in life.....	10
4. High expenditure per student and low educational outcomes.....	11
5. Efficiency in provision of education services across regions, 2003	12
6. Low completion rates in higher education and a difficult transition to the labour market	16
7. Small schools and small class size in Italy	20
8. What matters for educational outcomes?.....	24
9. Explaining educational outcomes: the North and South are not so different.....	25
10. Italian schools have relatively little autonomy and accountability	26
11. Italian teachers' wages are lower than the OECD average, but the gap has been closing.....	34

Boxes

Box 1. Institutional responsibilities in the Italian education system: current setting and changes under fiscal federalism.....	13
Box 2. The 2007 White Paper on Italian schools.....	17
Box 3. Planned legislation on schools	17
Box 4. An empirical analysis of determinants of educational outcomes in Italy.....	24
Box 5. Relation between feedback arrangements and schooling outcomes, some results from the literature.....	28
Box 6. Results and lessons from the first national external standard-based exam at the end of lower-secondary education.....	30
Box 7. Can education reform further the interests of teachers?.....	39
Box 8. Summary of the main recommendations on Education.....	43

Towards better schools and more equal opportunities for learning in Italy

By Romina Boarini¹

1. The average educational outcomes of 15-year old Italian pupils, according to the OECD PISA study, are among the poorest in the OECD area although education expenditure per pupil is high. Many international surveys show that learning outcomes of younger Italians are much better, which would point to a relatively strong weakness of secondary education. Furthermore, education seems to play a part in maintaining relatively low social mobility in Italy; families tend to select upper-secondary schools according to their income, leading to strong social clustering. There are also significant regional disparities across the country, partly associated with background socioeconomic factors. Poor overall educational attainment is a matter of concern in itself and is particularly important for Italy with its record of very low productivity growth and poor youth labour market performance; research has shown that while many structural and institutional features of an economy affect growth and the labour market, human capital is certainly a key influence.

2. This chapter covers compulsory education, exploring the reasons for poor and unequal performance in secondary education. After presenting the main challenges facing education in Italy, the chapter outlines the structure of spending and then considers how certain aspects of policy should be better aligned with good practice. Focusing on accountability and incentives, it then looks at how to motivate schools to improve performance and how teaching quality can be improved. There is a clear need for some fundamental reform, and a key difficulty will be getting the support of key schools' stakeholders, especially teachers themselves.

The main challenges facing Italian education

3. Italian educational outcomes at secondary level lag behind the OECD average, and PISA results show systematic differences between socioeconomic groups and regions. Education policy faces the challenges of improving average outcomes and the transition from school to the labour market, ensuring that education does not accentuate existing social and regional differences, and improving overall cost-efficiency. The ongoing process of fiscal federalism, with increased financial responsibility for education intended to be allocated directly to regions, might complicate reform, even though there remains a lot of uncertainty on the effective extent of devolution.

1. Romina Boarini works as an Economist on the Italy/Norway desk of the OECD's Economics Department. The author wishes to thank Paul O'Brien and Patrick Lenain for their many interesting suggestions and precious help on the drafting. She would also like to thank Andrew Dean and Jean-Luc Schneider for their very useful comments. Margherita Comola is warmly thanked for her work on the econometric analysis. Valuable input was also provided by Greg Wurzburg, Orsetta Causa, Piero Cipollone, Giovanna Barbieri, Aline Pennisi, Daniele Checchi, Massimiliano Bratti, Marco Leonardi, Claudio Lucifora, Andrea Ichino, Giorgio Brunello, Antonio Schizzerotto, Antonio Giunta della Spada, Giovanni Biondi and Andrea Cammelli. Statistical assistance was provided by Laure Meuro and Annette Panzera, editorial assistance by Pascal Halim and Heloise Wickramanayake.

Enhancing school results

4. Until the early 1960s, education was generally compulsory for only five years, eight years as from 1963, ten as from 2007.² At that time only 9% of the adult population had completed lower-secondary education and 4% held an upper-secondary education diploma, well below the OECD averages of 26% and 20%. By 2008, participation rates in upper-secondary education, which is still not compulsory, were above 80% and in line with the OECD average. The completion rate in upper-secondary education is 86%, in line with the EU-19 average and slightly above the OECD overall (83%). While participation in education has been increasing rapidly, the legacy of the past is such that only half the population has attained upper-secondary education, compared with two thirds in the OECD area as a whole.

5. Despite rising participation, Italians have mediocre results in international education assessment surveys. PISA surveys finds that Italian pupils in upper secondary school achieve levels of numeracy and literacy among the lowest in the OECD (Figure 1). This is despite very good average performance in Italy for younger children -- aged around 10 - on reading and science (PIRLS, 2007, and TIMSS, 2008). Performance in mathematics is however below average even for younger children. In the most recent PISA study, the average science score recorded by an Italian 15 year-old is lower than that of the average OECD student by an amount equivalent to nearly two-thirds of one school year, and more than two school years behind that of Finnish 15 year-olds, the best performers in the OECD area. Low achievers have a lower performance in Italy than in the rest of the OECD area (the mean PISA score of the (lowest) 5th percentile is 318, as compared to 340 in the OECD area and 419 in Finland); similarly, high achievers have lower score results (Italian pupils in the 95th percentile of PISA distribution score 20 points lower than those at the same position in OECD distribution). There has been a significant deterioration in relative reading performance (by nearly the equivalent of two-thirds of one school year) over 2000-06, but relatively stable achievement in science and maths.

6. National data also reveal problems. In 2007, almost half of all upper-secondary pupils failed to reach the level in mathematics required to go to the next year, one-third of them failed in foreign languages and over 10% in Italian.³ Although most students failing in one subject at the end of the term manage to be admitted to the next grade after successfully retaking the exam in the summer, 16% of those enrolled in a given grade had to repeat the year (*La scuola in cifre*, 2007).

7. This chapter does not investigate the reasons of good performance of primary education as opposed to secondary education. Potential explanations include the different, somewhat more specific training structure of primary education teachers; the organisation of curricula (primary education learning time is not strictly divided into subjects but in curricular areas); and the type of curricula (primary education curricula are closer to those tested by the relevant international surveys). Unfortunately empirical evidence corroborating these hypotheses is scarce.

Reducing regional disparities in learning outcomes

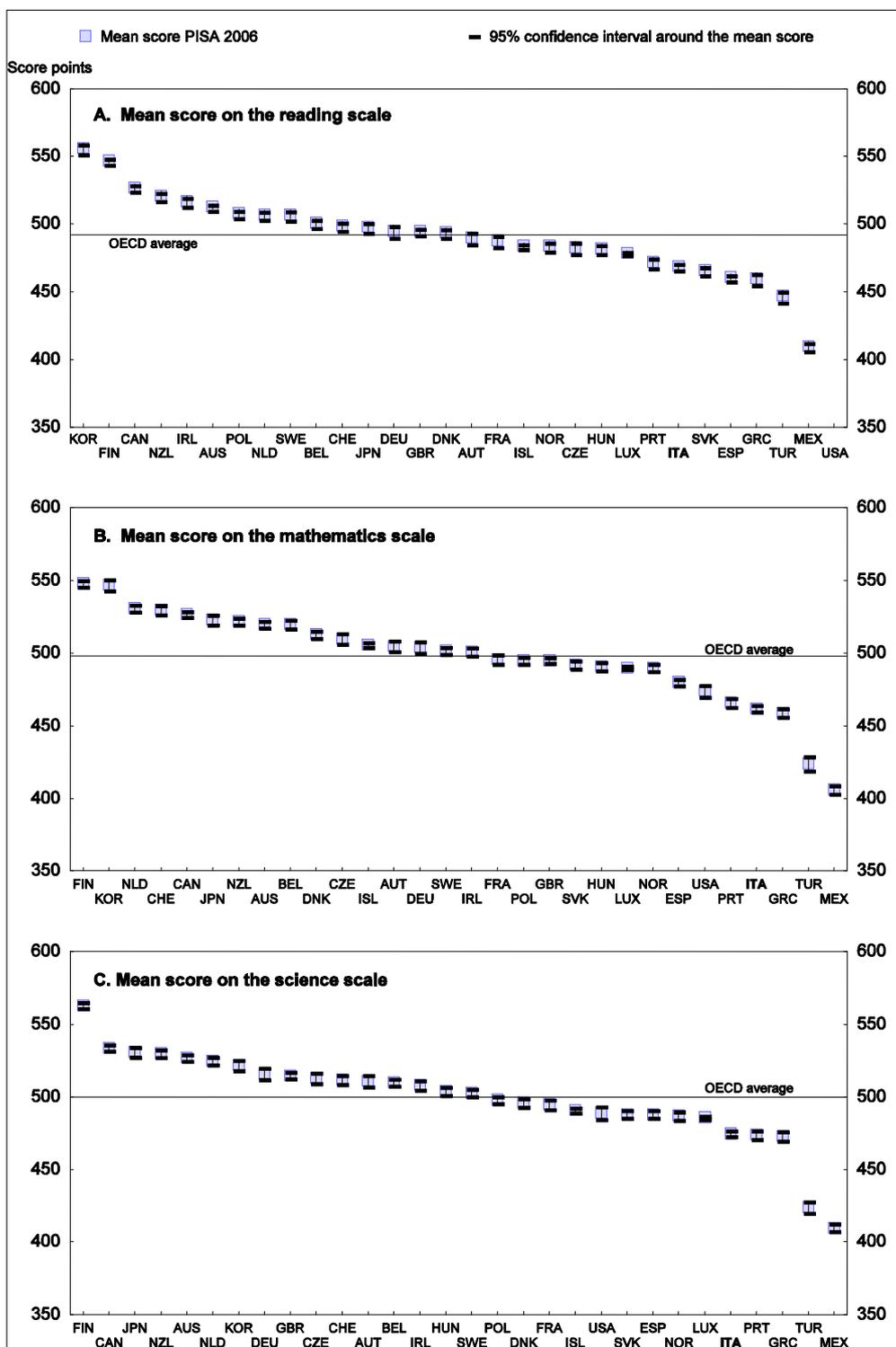
8. School performance varies markedly across Italian regions, notably between the North and the South (Figure 2, Panel A). While the variance of overall PISA scores in Italy is slightly lower than for the OECD area, around 12% of it is accounted by between-region differences - as much as by individuals' family background. There is a difference of 2½ school years between the best and worst performing

2. In practice, eight years study was effectively the norm somewhat before 1963.

3. Failure ("giudizio sospeso") refers to the fact that at the end of the year, the school judges that a pupil did not reach a sufficient level of competence in a specific subject. Pupils can re-take exams in up to three subjects over the summer. Unless they succeed in these exams they have to repeat the school year.

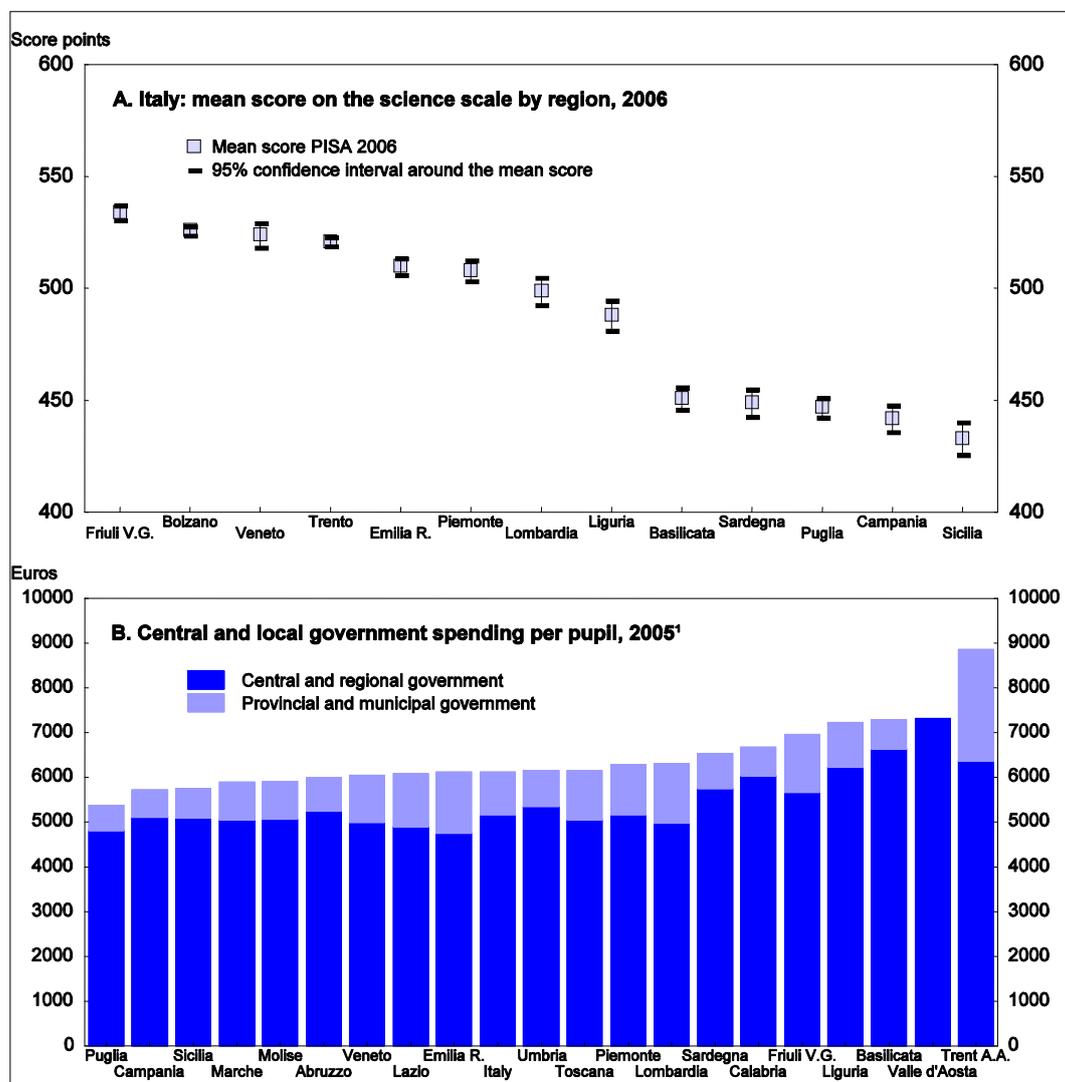
regions. In southern regions and in the Islands the majority of pupils record a proficiency level of 2 or below, but in the north the majority reach a level of 3 or above. The lowest-performing region has almost one pupil in 5 who does not even reach the first - very basic - level of proficiency.

Figure 1. Italy has below-average PISA scores



Source: OECD PISA database 2006.

Figure 2. **Strong disparities in educational outcomes across regions**
and unequal local government funding



1. Data refers to spending per pupil by the central level government and by the federal government (including communes, provinces and regions) covering financing of core educational services and ancillary services.
 2. In Trentino and Valle D'Aosta, two fiscally independent regions, the overall funding comes from regional government.
- Source: OECD PISA database, 2006; Ministry of Education .

9. In their replies to the PISA student questionnaire, pupils in the northern regions have a correct assessment of their ability and skills. In contrast, pupils coming from the southern regions always overstate their capabilities. The standards against which they are assessed seem lower and/or they receive insufficient feedback on their skills. Schools probably adapt to pupils' greater needs by imposing lower pressure and to some extent it is legitimate that schools take into account the specific context in which they operate. But inaccurate feedback may penalise students when it comes to preparing them to compete on an equal footing with peers in other regions or other countries, when entering universities and the labour market.

Reducing inequality in education outcomes

10. Variation in performance is also linked with the extent to which the education system helps individuals with unfavourable social origins. The impact of the socio-economic background on educational achievements can be measured directly (Figure 3, Panel A), or by analysing the extent to which it occurs through peer effects - social clustering at school level (Figure 3, Panel B). On the basis of these two indicators, the Italian situation is mixed. The direct impact of family origins on educational achievement for a pupil within a given school is in fact slightly smaller than in the OECD area as a whole: Italian pupils coming from a lower social background than the average lag behind by the equivalent of 1.1 school year, compared with 1.3 for the OECD area. However, the large between-school effect in Figure 3 Panel B shows a strong effect from social clustering; a pupil moving up the “social ladder” would improve her PISA score by three times more by moving to a school with a higher average socio-economic background than by staying within the same school.

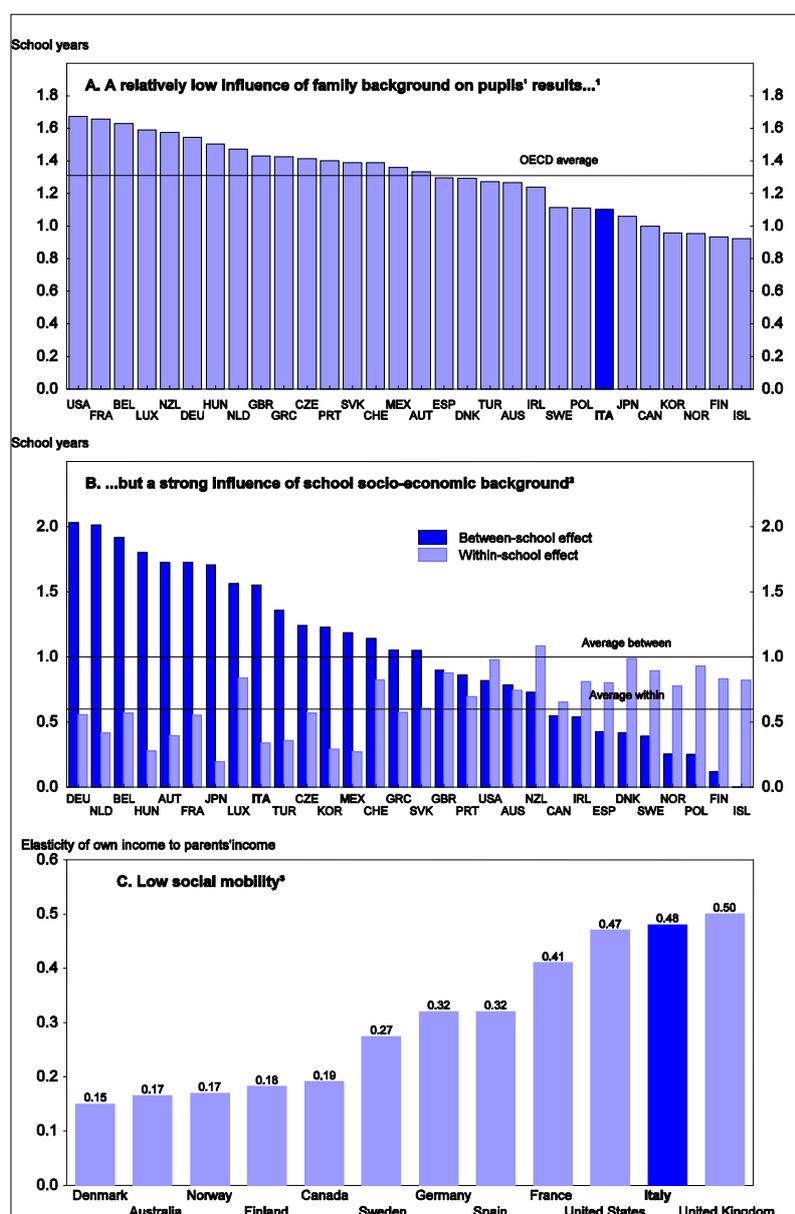
11. The effect of social segregation on performance can be explained by a number of interrelated factors: peer and neighbourhoods effects, as well as teachers’ self-selection into better schools (Bratti *et al.*, 2007; Leonardi, 2007; Barbieri *et al.*, 2007). Social clustering in schools occurs through the selection of type of upper-secondary school (theoretically-based in a *liceo* or vocational-based in an *istituto tecnico* or an *istituto professionale*). This selection is the free choice of parents and, as Bratti *et al.* (2007) show, is very highly correlated with social origins. Although this clustering is the result of self-selection, and not an involuntary consequence of tracking policies as in Germany and Luxembourg, it seems in practice to be an important source of social immobility in Italy, shown in the bottom panel of Figure 3. While income and wealth persistence across generations is a consistent finding in many national and international studies (Brandolini *et al.*, 2004, OECD 2008j), there are other factors besides the education system that may account for it. Labour market and welfare policies are among the most important ones (Checchi *et al.* 1999; Colonna, 2007; D’Addio, 2007), although education and labour market institutions exert interrelated influences.

Raising cost efficiency

12. Italian schools appear to be less cost-efficient than those of other OECD countries, with high expenditure per pupil and poor educational outcomes (Figure 4). There are a number of possible explanations, such as the failure to exploit economies of scale in class formation or the lack of incentives for schools to make the best use of available resources. With strong budget constraints on expenditure, there is pressure to reduce Italy’s high spending on education and, as Figure 4 shows, it should be possible to spend less without compromising educational outcomes; this is an important conclusion of the 2007 White Paper on education and of the Spending Review (2008). However, it is unlikely that severe cost-cutting measures, unless accompanied by a comprehensive change in schools’ organisation and functioning, can avoid some deterioration in performance. It is thus of the uppermost importance that part of the savings obtained by reduced expenditure are reinvested appropriately in the measures aimed at increasing schools’ incentives to raise performance, as outlined in the rest of the chapter.

13. In fact, the 2009-11 Budget Law includes quite severe cuts, implying a 10% reduction of the teaching working force over three years. These measures, partly inspired by the 2007 White Paper, are in line with commitments by the last two governments to tackle the inefficiency of public expenditure. The reasoning behind these measures, which will be explained in more detail in the following section, is twofold: first, children are not allocated to classes and schools as efficiently as they could be; secondly, the number of students per teacher, which the literature has generally shown to be unrelated to educational outcomes, is lower in Italy than the OECD average. The Budget Law allocates 30% of the savings to measures to raise the profile of the teaching profession. The exact measures are not however identified yet.

Figure 3. Social segregation between schools may hinder social mobility later in life



1. This figure shows the impact of family background on educational achievement, measured by PISA scores, at individual level. These estimates, which are obtained by a bivariate regression of PISA scores on the PISA index of socio-economic background, are expressed in terms of gaps that one may accumulate during one or more school years. The school lag equivalent is obtained by calculating the difference of PISA score between two students enrolled in the two grades (everything else being equal). One school year corresponds to 38 points on the PISA science scale.
2. The individual background effect is defined as the difference in performance on the PISA science scale associated with the difference between the highest and the lowest quartiles of the average individual background effects distribution of the PISA index of economic, social and cultural status, calculated at the student- level. The school environment effect is defined as the difference in performance on the PISA science scale associated with the difference between the highest and the lowest quartiles of the country-specific school level average distribution of the PISA index of economic, social and cultural status, calculated at the student level. These estimates, which are obtained by regressing PISA scores on the PISA index of socio-economic background at individual and school level, are expressed in terms of the school lag that one may accumulate during one or more school years. One school year corresponds to 38 points on the PISA science scale. Regression of students' science performance on students' family socio-economic background (as measured by PISA ESCS), and school-level socio-economic background (average PISA ESCS across students in the same school, excluding the individual student for whom the regression is run). Country-by-country least-squares regressions weighted by students' sampling probability. Robust standard errors adjusted for clustering at the school level. Regressions for Italy include regional fixed effects.

3. The height of each bar represents the best point estimate of the intergenerational earnings elasticity resulting from various studies reviewed by D'Addio (2007). The higher the parameter, the higher is the persistence of earnings across generations and thus the lower is intergenerational earnings mobility.

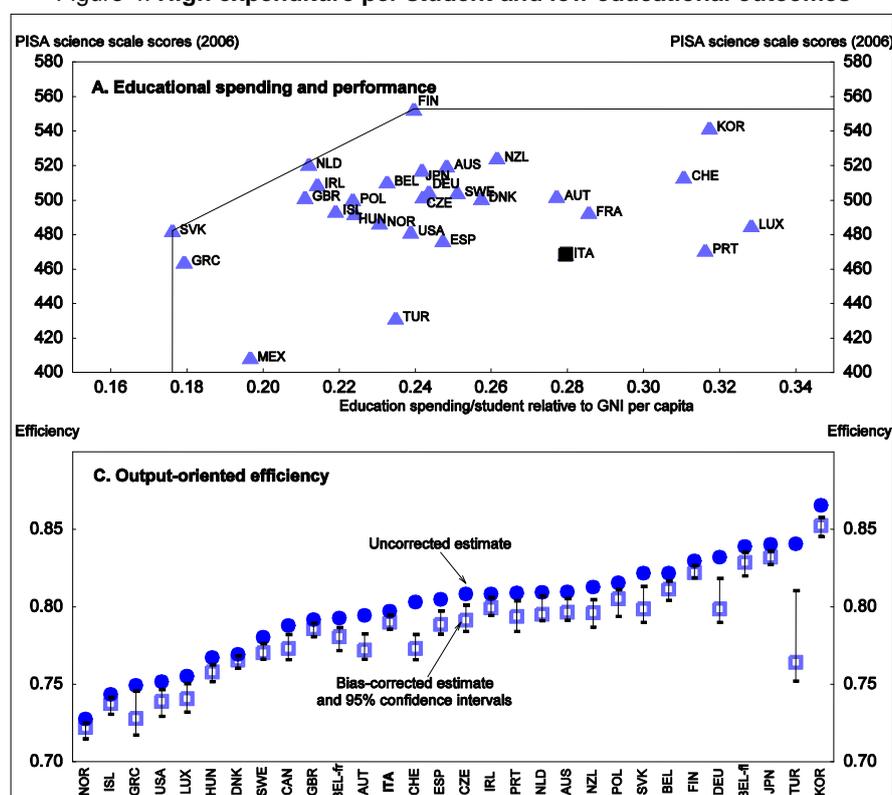
Source: Panel A and B, Causa and Chapuis 2009. Panel C based on D'Addio (2007).

Managing regional diversity and fiscal federalism

14. The level of central government funding is fairly homogenous across schools, reflecting relatively uniform rates of teacher compensation. There are quite large differences in the local funds transferred to schools from provinces and communes (local funding per student being more than as twice as much in Emilia Romagna than in Puglia, for example), although the share of local funding is typically less than one fifth of the total at the moment (see Figure 2, Panel B).

15. The observation that there is wide regional variation in pupils' performance but relative homogeneity in funding levels suggests considerable variation in efficiency, with lower PISA scores in southern regions implying lower efficiency. This is not certain, however, as some simple analysis shows. A Data Envelopment Analysis (DEA) using one input (student per teacher ratio) and one output (average PISA score) does indeed imply that northern regions are generally more efficient than central and southern regions (Figure 5, Panel A, horizontal axis). However, results depend on a number of background and contextual variables outside the school's control. Using a DEA specification based on three inputs (student per teacher ratio, index of socio-economic background of parents and computer possession), as in Sutherland *et al.* (2007), regions that are disadvantaged in terms of their social and cultural environment improve their relative position, in some cases considerably, such as Calabria and Sicily (Figure 5, Panel A). In this specification, there is considerable clustering of output-efficiency estimates, though there are four or five low performing outliers. A similar analysis in Giordano *et al.* (2008) finds that efficiency in education services provision is more homogeneous across regions than in other public services (health, civil justice and child-care), supporting the idea that differences in school efficiency across the country may be lower than at first sight.

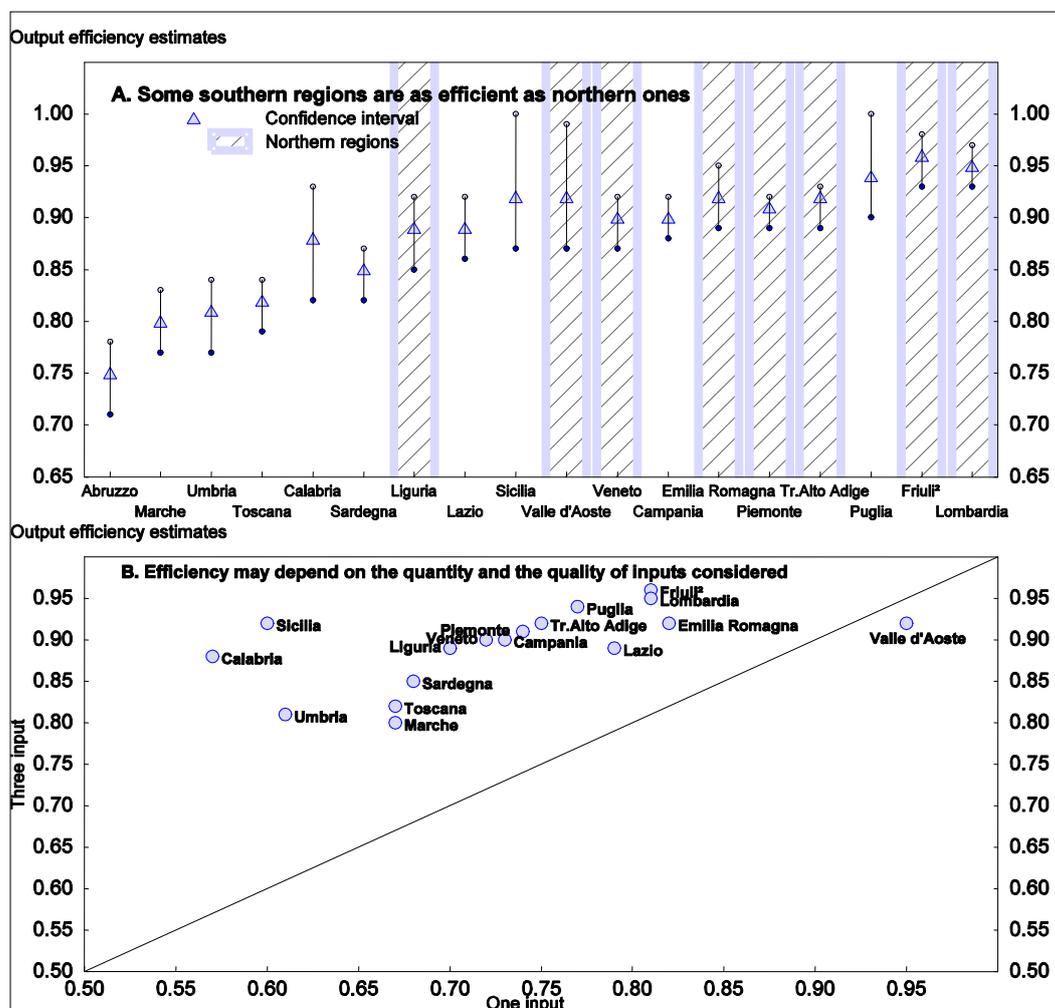
Figure 4. High expenditure per student and low educational outcomes



- Efficiency estimates apply to the median school in each country. The estimates are obtained through data envelopment analysis performed with four inputs (teaching and computing resources, socio-economic status of students, and language background) and one output (average PISA score).

Source: OECD (2008a) and Sutherland *et al.* (2007).

Figure 5. Efficiency in provision of education services across regions¹, 2003



- The first panel shows DEA estimates and corresponding confidence interval of efficiency in provision of educational services. The DEA specification uses three inputs (teacher per student ratio, socio-economic family background and possession of computer at home) and one output (average PISA score). Efficiency scores are bias-corrected output efficiency scores, under the assumption of constant returns to scale. The second panel shows efficiency scores for one input (teacher per student ratio) and one output on the x axis, and efficiency scores for three inputs and one output. Efficiency estimates vary between 0 and 1, where 1 denotes maximum efficiency.

Abruzzo (not shown in Panel B) has an one-input score of 0.41.

- Friuli Venezia Giulia.

Source: OECD calculations on 2003 data.

16. However, regional variation in cost-efficiency certainly exists and is indeed one of the main challenges of fiscal federalism. According to the fiscal federalism law that, together with other previous laws, devolves education to regions although at a very general level (see Box 1), basic finance has to be provided from central funds as to provide national standard levels of service (LEP), based on estimates of the “standard cost” of providing such levels of service. At the moment the interpretations of LEP and the

related implications for redistribution of resources, are still very much debated and will be the object of negotiations between the central level government and the regions. It is however unlikely that resources transferred to regions will cover staff salaries.

17. Another open issue, which might have consequences in terms of regional inequality in educational outcomes especially if LEP are output based, is the definition of standard costs. This is likely to be controversial - will it, for example, take into account the contextual variables used in Figure 5? If it did, and if regional variation in efficiency did not increase, there would be less inequality of outcomes; if not, especially with - as might be expected – increased variation in efficiency, inequality could increase. Further complications may arise from cultural or contextual differences across regions in the ability of sub-national governments to use autonomy effectively; Giordano *et al.* (2008), find that in southern regions public services are more efficient when they are provided at central level, while in the North decentralised services tend to be more efficient. Finally, standard costs will also have to properly take into account uneven migration trends within the country.

18. While the extent of devolution is a political choice left to each country, it has to be borne in mind that if fiscal federalism is meant to increase efficiency among sub-national governments, LEP ought to rely on a notion of measurable output performance. In this respect the last Economic Survey on Italy recommended specifying national standards of social services to reflect output rather than input and to set clear attainment and achievement standards, leaving the mix of inputs and organisation of services to regions, while providing better national testing, monitoring and guidelines for compliance.

19. Whatever the precise model of fiscal federalism, differences across the country in various factors, not least in institutional capacity to deal with managing education and in local social and political contexts, will lead to some variation in outcomes. If central and regional governments collectively wish to avoid this, policies to reinforce the competencies of local administration may need to be envisaged in addition to the reform of the national education system. In addition, the potential reforms to the education system will have to be designed as to ensure the consistency and the coordination of the various levels of governance, as also recommended by the White Paper on Education (Box 2).

Box 1. Institutional responsibilities in the Italian education system: current setting and changes under fiscal federalism

In Italy the central government is currently responsible for:

- General guidelines and legislation on education, including objectives of school curricula; definition of educational programmes; staff contracts.
- Specification of subjects studied, instruction time, share of compulsory and non-compulsory instruction time, quality standards for services provided, general guidelines on evaluation of students, teaching time, evaluation of school system, determination of staff needs and the level of central resources to finance them.

The regional governments are responsible for:

- Legislating on specific education guidelines, together with the central level government (potestà legislativa concorrente). They hold exclusive legislative power however on vocational education and training issues.
- Providing and planning the supply of vocational training (the provision of vocational education being a responsibility of central level government).
- Fixing the calendar school year.
- Planning the school network on the regional territory, including the merging of schools with insufficient rolls.
- Provide financial help to students from low-income families.

Finally, the regional education offices (“Uffici Scolastici Regionali”, reporting directly to the Ministry of Education),

are responsible for:

- Intermediating the teacher allocation process (from the central level government to the schools).

The law on fiscal federalism (L. 42, 2009) reaffirms the general lines of devolution of education responsibilities to regions, though it is not clear whether it innovates with respect to the existing legislation (according to the law, national standard level services refer to “administrative functions already under regional responsibility”). Some, forthcoming administrative by-laws will provide the substantive regulation by 2011. Not only will these laws have to specify the exact responsibilities of regions but also how “basic levels of educational services” (*livelli essenziali delle prestazioni*) should be defined and what this will imply in terms of resources transferred to regions.

Improving the transition from secondary to tertiary education and the labour market

20. Secondary education should prepare pupils either for higher education or for entry into the labour market. With respect to the former, entry rates into tertiary education have recently reached the level of other OECD countries after having lagged behind for many years (Figure 6, Panel A). Part of this improving performance depends on the almost total absence of any selection at university entry (including the type of upper-secondary education attended), but high drop-out rates at university may indicate that the school system does not prepare pupils well enough for higher education (Boarini *et al.*, 2008).⁴

21. As for direct entry into the labour market, quite apart from the fact that a significant share of children does not enter upper-secondary education, secondary school leavers have difficulties when entering the labour market (Quintini and Martin, 2006). The unemployment rate for 15-24 age group fell between 1995 and 2005, but the ratio of youth to adult unemployment remains the second highest in the OECD. In Italy only one-third of the 15-24 year olds are employed, versus two-fifths in the OECD area. Half of the young unemployed experience long unemployment spells, compared with one-fifth in the OECD. The share of young adults who are neither in education nor in employment has also fallen since the mid-1990s, but it stands at 10% of 15-19 year olds and 25% of 20-24 year olds, compared with the OECD averages of 8% and 16% respectively (Figure 4.6, Panel C).⁵ Transition to the labour market is especially difficult in central and southern regions, where the unemployment rate of 18-24 year olds is around 26%, as compared to 10% in the North and 13% in the OECD area.

A comprehensive reform is needed to take up all the challenges

22. So far, government initiatives on school education have focused only on expenditure reduction, although the previous government’s 2007 White Paper and the Spending Review (2008) provided a considerable number of recommendations to complement expenditure reduction (Box 2). A draft law covering teacher training, incentives and career development was introduced by a member of parliament in July 2008 (Box 3), but has yet to be formally adopted by the government. This law is a very good opportunity for putting in place the framework necessary for raising the attractiveness and the effectiveness of the teaching profession, making concrete the possibility of reinvesting some of the saved resources under the Budget Law 2009-2011.

4. Boarini *et al.*, 2008 shows that higher PISA scores (at country level) result in higher completion of tertiary studies, when controlling for a number of other variables including rates of return to education, availability of financial help for students and institutional arrangements of tertiary education supply.

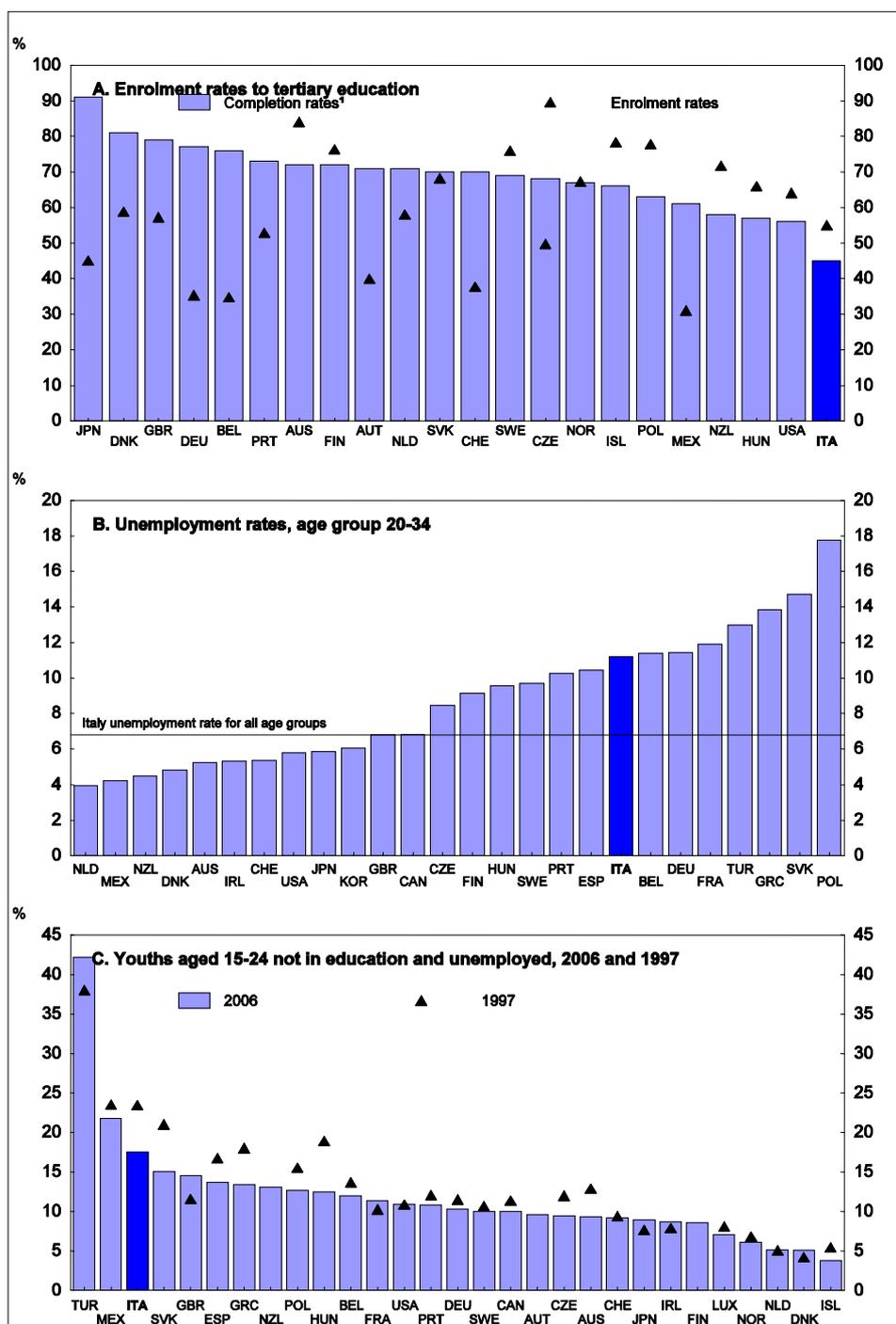
5. Two sets of factors lie behind this mediocre situation: on the one hand many drop out from upper-secondary education (above 20% in Italy, versus an OECD average of 14%); on the other, a very long school-to-work transition as shown by Quintini and Martin (2006). This may be labour-market related or due to the fact that the type of educational degree is inadequate for finding a job (Pozzoli, 2007; Confindustria, 2008), though the two kinds of explanation are clearly interdependent.

23. As the rest of this chapter argues, the system needs to be reformed in several dimensions, and piece-meal reforms have less chance of success than broader, integrated ones, notably because they impose the up-front cost of reform on a well-defined category of stake-holders (teachers and schools in this case), but do not spread the benefits across a sufficiently large group of citizens (Høj *et al.*, 2006). Successful reforms⁶ are often those that bring stake-holders on-board for both the principles of a reform and its implementation. In the case of Italy, schools and teachers may have been insufficiently involved in the policy-making process up to now.

24. Researchers have argued that insufficient consideration of the political economy aspects of reform as well as the narrowness of government measures has been a common feature of past Italian educational reforms, generating distrust among schools (Cavalli, 2000; Cavalli, 2008; Ferratini, 2008). This may help to explain why some of the measures taken, which look appropriate in theory, have not produced the expected results (e.g. the law on autonomy). The many conflicting interests at stake in education make reform complicated; involving stakeholders and explaining the motivation for change to the public may help both to design a comprehensive reform and to avoid frequent changes of direction, which can in themselves undermine even well-conceived policies.

6. See the report on the case studies in the Political Economy of Structural Reform project: ECO/CPE/WP1(2008)18 and (on Italy) ECO/EDR/PE(2008)2.

Figure 6. Low completion rates in higher education and a difficult transition to the labour market



1. Completion rates in tertiary-type A education represent the proportion of those who enter a tertiary-type A programme and obtain at least one first tertiary-type A degree.

Source: OECD Education database and OECD Employment Statistics.

Box 2. The 2007 White Paper on Italian schools

Recommendations put forward by the White Paper on Italian schools (*Quaderno Bianco sulla Scuola*), issued under the previous government, include:

- Strengthen school autonomy while at the same time reaffirming the role of the State in defining general orientations and providing national standard levels of services.
- Building up a forecasting model to plan the medium and long-term demand for teachers at regional level, with the aim of informing decisions on teachers' allocation so as to increase the efficiency of resources use across regions.
- Designing a national evaluation system encompassing external evaluation of students' progress and promotion of specific evaluations at individual school level, with support provided to school lagging behind and remedial programmes designed.
- Reforming teachers' career and work organization including the reform of initial training and recruitment, the introduction of performance incentives, actions to improve the matching between teachers and schools, and reform of in-service training.
- Specific additional actions to be undertaken in the South over the 2007-2013 period.
- Designing a multi-level governance system to implement regional action plans including special measures (such as suitable classroom size, merging schools, retraining teachers, etc.) to meet the targets fixed at national level. The governance system would ensure commitment and coordinated action between central Government, Regional and Local Authorities and schools, where responsibilities are clearly defined and incentives are provided across the board.

See Ministry of Education (2007).

Box 3. Planned legislation on schools

A draft Law was presented to parliament by Deputy Aprea (the "Aprea" law) with four key propositions:

- Teacher training, to be provided in universities, would last 5 years with greater emphasis on pedagogy and teaching practice. Conditions for access to training would vary for teachers of primary and secondary schools.
- Schools would be able to directly hire teachers through competition or direct recruitment from regional pools of pre-qualified teachers.
- A teaching career would be differentiated into three steps: "beginner" (*iniziale*); "tenured" (*ordinario*) and "expert" (*esperto*), with responsibilities and salaries varying accordingly. Promotion to *ordinario* would be decided by a commission internal to the school. Promotion to *esperto* would require specific training and a final competition. The number of promotions (at both levels) would be fixed by the Ministry of Education every year.
- School governance would be reformed, giving responsibility for administrative, financial and pedagogical decisions to a new school board chaired by the principal. Each school should have a valuation committee to assess school results and quality on an annual basis.

The draft law was presented to parliament in July 2008, but has not been explicitly adopted by the government. Many details that would be required for implementation are not spelt out, including the administrative infrastructure that would be needed for the new training and certification system, and how to integrate existing teachers into the new career structure. Its principles are in line with good practice, however.

Containing spending in primary and secondary education

Trends of spending per student in primary and secondary education and main determinants

25. While the share of GDP spent on school education is below the OECD average, expenditure per pupil is higher (particularly for primary and lower secondary schools). This feature reflects a historical pattern rather than a recent phenomenon; spending per pupil (in real terms) has grown more slowly than in the rest of the OECD area in recent years. Education has also lost some ground with respect to other public spending (Table 1). As in many other OECD countries, the bulk of expenditure on education goes to current expenditure, essentially to pay teachers and other staff. However, the share of capital expenditure, which some studies have shown to be associated with better educational outcomes⁷, is slightly lower than the OECD average, reflecting a lack of investment in buildings and infrastructures, which are known to be especially poor in the South of the country (Bratti *et al.*, 2007).

Table 1. **Education expenditure in Italy**

		Italy	OECD
Total education expenditure, share of GDP		3.3%	3.8%
Private expenditure, share of total		3.9%	8.3%
Primary and secondary education expenditure as a share of total public spending		6.7%	9%
Primary and secondary education expenditure per student	share of per capita GDP	27%	23%
	real growth, 1995-2005	4%	29%

Source: EAG, 2008.

26. The higher cost of Italian education is largely due to the teacher-per-student ratio being about 50% higher (9.6 teachers per every 100 pupils in Italy, versus 6.5 teachers in the OECD area)⁸. The ratio is quite homogenous across regions, schools in the South having slightly fewer teachers per student at primary and upper-secondary education but more in early and lower-secondary education. On the other hand, the level of wages is lower in Italy (see sections below).

27. Many studies have found that the teacher-per-student ratio, or its determinants, have no influence on learning for “median” pupils (e.g. OECD, 2004); it does have an impact in classes with a high proportion of pupils with learning difficulties, however. The evidence is more mixed for wages paid to teachers, which appear to be positively correlated to outcomes in some studies (OECD 2008d, Sutherland *et al.*, 2007) but not in others (Hanushek *et al.*, 1999), though in theory higher compensation provides better incentives to enter and stay in the teaching profession. Considering that Italy spends quite a lot due to a relatively teacher-intensive technology, but pays its teachers relatively less, redesigning the trade-off between the number of teachers and wages could increase efficiency. However, as argued in later

7. Some evidence on the positive impact of capital expenditure on educational outcomes (Guichard, 2005) is corroborated by a national study showing that lack of infrastructures and poor status of school buildings explain part of the Italian regional disparities in educational outcomes (Bratti *et al.*, 2007).

8. This ratio refers to the standardised OECD definition of teachers, which includes religion teachers but excludes both teachers for special needs children (“*insegnanti di sostegno*”) and teaching assistants (“*assistenti di laboratorio*”). In addition, the number of teachers entering in this ratio refers to those having a central-level contract (“*organico di diritto*”) excluding school-level contracts (“*organico di fatto*”). Including the latter, special needs teachers and teaching assistants, the Italian teacher per student ratio rises to 11.5 teachers per 100 pupils (White Paper, 2007).

sections, it is preferable to link salary increases to good performance rather than increasing wages for all teachers unconditionally.

Why does Italy have more teachers per student?

28. The high teacher-per-student ratio in Italy reflects two sets of factors. First, certain regulatory provisions (on the number of instruction hours, teaching time, school size, class size, allocation of teachers to subjects taught, length of schooling)⁹ lead to a large number of teachers. Second, the education authorities seem fall well short of optimising class and school size within the bounds set by regulations.

29. Taking the first group of factors, the higher teacher-per-student ratio is explained in almost equal proportions by a higher instruction time for children than the OECD average, lower teaching time for teachers and smaller class size, irrespective of the educational level (Table 2). Historical political choices, partly based on the questionable premise that more instruction time and smaller class size lead to better outcomes, were at the origin of the current curricular and class structure. While these policy choices ought to be reconsidered in the light of the evidence that the impact of instruction time and class size is small, there is leeway to reduce the cost of education, simply through better planning and allocation of teachers to schools (White Paper).

Table 2. **Determinants of teacher per student ratio Italy**

OECD average gap¹ various levels of education, 2006

		Primary schools	Lower-secondary schools	Upper-secondary schools
Teacher per student ratio, gap		1.51	1.30	1.14
Instruction time, gap		1.24	1.17	1.12
Net teaching time, gap		0.90	0.84	0.90
Class size, gap		0.86	0.88	0.86
Teachers per 100 student	Italy	9.4	9.7	9.1
	OECD Average	6.2	7.5	8.0
Instruction time	Italy	990	1089	1089
	OECD Average	796	933	971
Net teaching time	Italy	735	601	601
	OECD Average	812	717	667
Class size	Italy	18.4	21.0	23.4
	OECD Average	21.5	24.0	27.0

1. The gap is calculated as the ratio of the Italian figure to the OECD average.

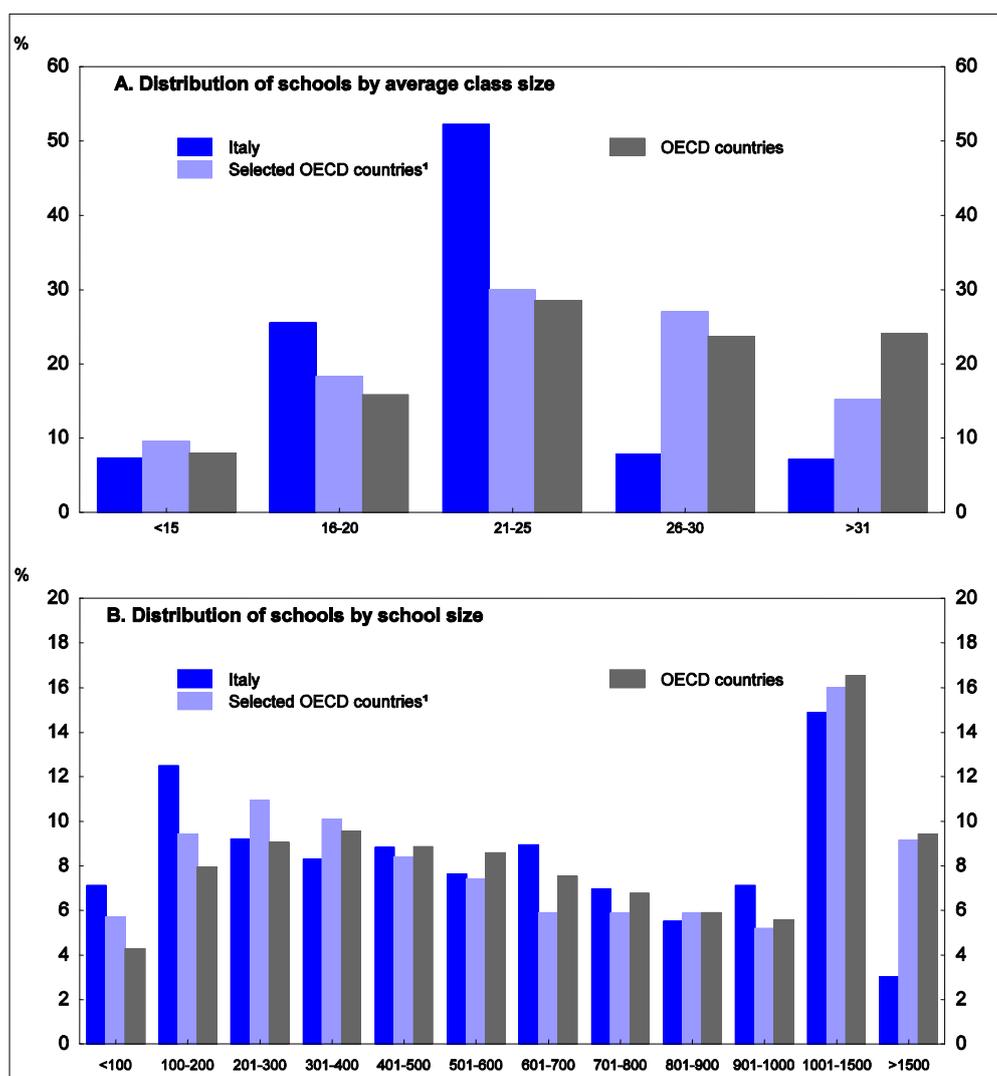
Source: OECD calculations on EAG, 2008, Tables D1.1, D2.1, D2.2, D4.1; and on PISA data as concerns class size for upper-secondary schools.

30. According to current legislation, classes can include 10 to 25 pupils in primary school, 15 to 25 in lower-secondary school and a maximum of 25 pupils in upper-secondary school (thresholds can be exceeded by 10%). In practice, however, class size is skewed towards the lower bound of the tolerated interval, with an average of 18.5 pupils in primary schools, 21 in lower-secondary schools and 22 in upper-secondary ones (but with one class in four with less than 15 students in primary schools and one in three in lower-secondary schools). Though Italy is one of the European countries where the regulatory provision on the maximum class size is the lowest, there are other countries with an equally restrictive regulation but where the actual class size is bigger, such as Hungary and France (Eurydice, 2008). Indeed, even if average school size is relatively comparable to that of other OECD countries, class size is smaller

9. The number of years of primary and secondary schooling is 13 in Italy, while in most countries this is 12. Grade 13 classes are often small as a result of selection and drop-out in previous years.

in Italy: schools have many small classes (Figure 7, Panel A). Italy stands out for the small size of its classes and for its high number of small schools, even when compared with countries where expenditure per student is higher (Figure 7, Panel B).

Figure 7. Small schools and small class size in Italy



1. With higher expenditure per student than in Italy.

Source: PISA 2006.

31. Geographical patterns do not explain the large number of small schools and small classes: they are as frequent in large as in small towns. According to the 2007 White Paper, the small size of buildings does not constrain the expansion of schools, although there may be some infrastructural problems especially in buildings that were not initially conceived to be schools. Generally, classes tend to be small because pupils are assigned to classes within relatively small groups (the school section, *plesso*); the existence of spare capacity in a class in one section is not taken into account when calculating the number of classes needed in another. According to the White Paper, if classes were put together at school or at commune level, class size would be reduced by 2 to 3 pupils in primary schools and by 1 pupil in

lower-secondary school. This would eliminate the class size gap to the OECD average for primary schools and reduce by one-third the gap at lower-secondary level. No substantial gains would be achieved for upper-secondary schools, where classes are bigger and more efficiently put together. These gains would be pretty much the same irrespectively of the size of the commune.

32. Another factor underpinning the high teacher-per-student ratio is the specific national provisions for disabled students which, since they aim at their integration within the ordinary school system, imply additional teachers (nearly 90 thousands) and a smaller class size.¹⁰ There are no comparative studies on the cost-efficiency of this model, as compared for instance with that of other OECD countries where special needs children go to special schools and/or where part of the funding comes from social protection. The integration of disabled children is an important goal *per se*, however there is some leeway for increasing efficiency as certification for disability could be stricter and the allocation of teachers supporting disabled students could be organized at a wider territorial level instead of the school or class level.

33. Another source of inefficiency is the timing and the allocation of teachers to schools, which occurs in three stages each year and is managed by the school with little transparency.¹¹ According to the 2007 White Paper, schools' negotiation in the first stage is deliberately opaque in order to leave the possibility of hiring additional teachers, so as not to reduce the number of classes or teaching positions. Neither schools nor the regions are held responsible for poor planning of classes, so that none has strong incentives to make appropriate use of the available information. If this system is retained, future reductions in the number of teaching positions will have the same impact on transparent and efficient schools as on those which have not fully disclosed information on their actual needs. This highlights a limitation of the government's plan to make across-the-board reductions in the number of teachers, without taking into account past efforts to contain class size.

34. Besides leading to inefficient school planning decisions, the current system produces insecurity of employment and distorts teachers' incentives (see Barbieri *et al.*, 2007 and section below). To address this concern, the White Paper suggested introducing multi-year planning of teacher needs, on the basis of demographic projections at the regional level. Multi-year planning can be quite resource-intensive and perhaps not even necessary if demographic changes are small and some flexibility is preserved, but it supports negotiation process and transparency in the allocation mechanism. Moreover, it makes it possible to face the specific challenges set by uneven demographic trends in the country considering the relatively limited mobility of teachers across regions as well as the regional heterogeneity of permanent versus temporary jobs. The delegation of planning authority and accountability to regions is certainly desirable, and is consistent with the fiscal federalism process under way.

35. In most cases, therefore (with the notable exception of schools with a large proportion of pupils with learning difficulties, such as vocational schools in southern regions), there is substantial leeway for

10. According to these provisions: 1) there is one supporting teacher for every two students with disability; 2) the maximum class size is reduced by 5 students when a disabled pupil is in the class. Some estimates suggest that, all together, the special support to disable students requires as many as 150 000 additional teachers (White Paper, Spending Review 2008).

11. In the spring, the number of teachers for the next school year is decided at the central level on the basis of the expected enrolment rate ("organico di diritto"). From then to the beginning of the school year, negotiations between schools and the Ministry of Education tend to keep job positions open even if it is not clear they are needed ("organico di fatto"). Finally, during the new school year, schools may hire temporarily additional teachers, to fill unexpectedly vacant positions or gaps due to sick leave ("organico di fatto effettivo"). Overall, in 2005, for 100 teachers, 90 were hired at the first stage of negotiation, 4.2 at the second one and the remaining 5.8 at the end of the process.

increasing class size without harming student achievement. For most schools, new class size criteria should be defined (in terms of teacher-per-student ratio) so as to make them consistent with the agreed national standard level of services (*Livelli Essenziali di Prestazione*) benchmarked at standard cost. Under the new fiscal federalism arrangements, it would be logical to make regions responsible for defining and implementing these targets; moving the planning of class and school size to a higher level (regional or provincial), would increase the economies of scale in school network planning. Similarly, regions should plan transparent consultation with schools to determine the required change in the number of teachers. Alternatively, regions could directly manage the teacher allocation process, by collecting students' preferences and assigning students to schools, taking into consideration students' preferences and travel distances.

36. Among other possible ways to increase cost-efficiency, the recent measures to reduce instruction time by about 10% at all educational levels seem appropriate: statistical evidence suggests that longer overall instruction time has no beneficial impact on educational achievements. But such reductions should be focused on non-core activities, where instruction time is long by OECD standards, rather than on mathematics and scientific subjects, where Italian students are particularly weak and where there is evidence that instruction time matters. Lengthening teachers' teaching hours could contribute to expenditure reduction if salaries were unchanged, but, with teachers' wages already relatively low, such an increase in the number in teaching hours might not seem realistic.

The main drivers of educational outcomes

37. A growing literature, especially using PISA data (e.g. Wößmann *et al.*, 2007a), has identified a number of key facets of education policy that influence educational outcomes. Many, though not all, of the results confirm the intuition that outcomes respond to incentives when the system is designed to be performance oriented. Thus, autonomy and accountability are key concepts, the first requiring that teachers and schools are free to organise teaching and teaching methods in the way they think will give the best results, the second requiring that decision makers are held to account in some way for the consequences of their decisions. Autonomy (such as in staffing decisions or budgetary allocation within schools) without appropriate accountability can be worse than no autonomy at all. This literature has also produced the perhaps surprising result that the overall level of educational spending, or the pupil-teacher ratio, has no clear impact on outcomes, with the exception of pupils coming from a difficult socio-economic background and pupils at the very early stage of education (Piketty and Valdenaire, 2006; Gufstafsson, 2003; OECD 2004). Nevertheless, other plausible influences on outcomes, such as instruction time for particular subjects (though not overall instruction time), and nationally standardised exit exams to provide objective information on performance, are confirmed as important.

38. For this *Survey*, an empirical exercise was conducted using PISA data, building on the results of Wößmann *et al.* (2007a) to identify other influences on education performance particularly in the context of regional variation within Italy (Box 4; details can be found in Annex 4.A1).

39. Among the non-policy determinants of students' results, social origin has a very important influence, both at the individual level and at the school level (*i.e.* through "peer" and "contextual" effects, respectively) as well as migrant status. Across the whole OECD sample, one standard deviation of the index of socio-economic background is associated with 21 PISA points, *i.e.* the equivalent of half of one school year. The impact of social origin is slightly higher when it operates through social clustering at school level (27 PISA points). Pupils born out of the country and those who do not speak the national language at home have substantially lower results than natives. In Italy, the impact of family background at individual level is smaller than in the OECD in general (and tends to decrease at higher levels of socio-economic background), but the family has a greater influence in school choice. The disadvantage

associated with immigrant status or from not speaking the native language is slightly higher in Italy than in the OECD area average.

Autonomy and accountability of schools should be increased across the country

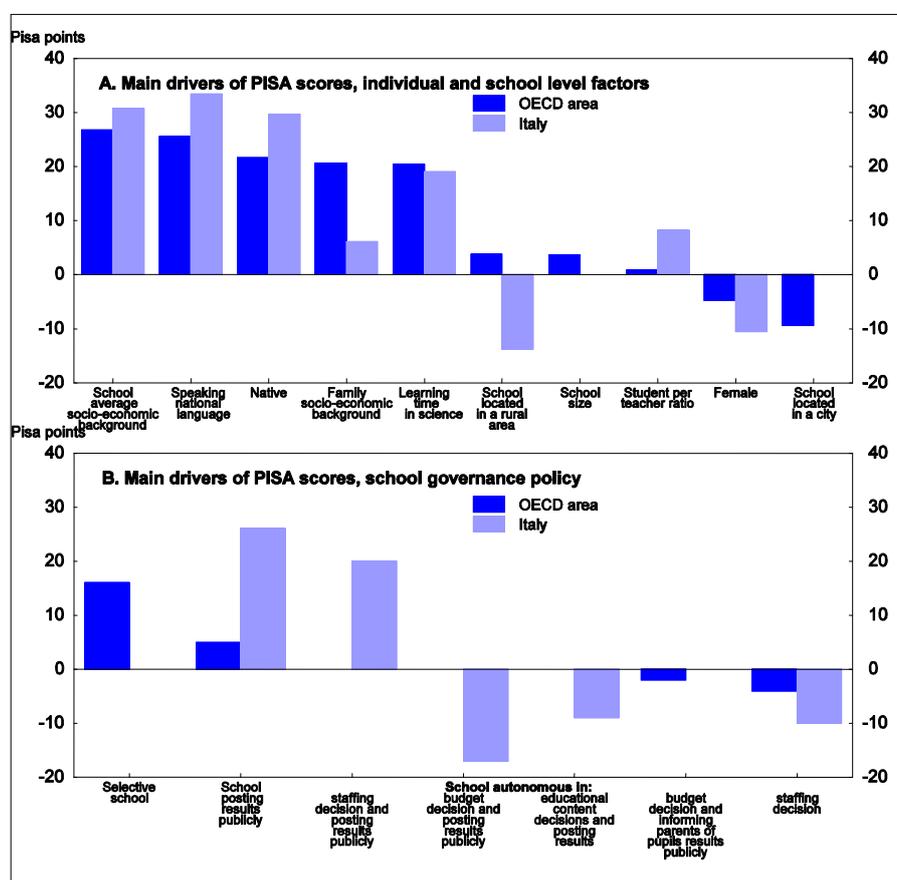
40. This empirical exercise confirms that institutional arrangements of the school system, in particular the distribution of responsibilities among actors and the importance of performance incentives, do affect educational achievements quite significantly. This is true not just across different OECD countries but also in accounting for variation within Italy. The result that school autonomy in staffing decisions is detrimental for educational outcomes unless it goes together with accountability is especially noticeable in Italy, although the reliability of the underlying data is uncertain (in principle there should be very little variation in the – very low – level of school autonomy). By contrast, in the Italian sample, autonomy in choosing the educational content and in allocating the budget within the schools are associated with lower PISA scores even in schools assessed as relatively accountable. This may well be related to the fact that these two forms of autonomy are widespread among Italian private schools, which (in a similar statistical exercise) tend to perform worse than public schools.

Box 4. An empirical analysis of determinants of educational outcomes in Italy

The empirical analysis was carried out to identify the main determinants of PISA scores, both from a cross-country perspective and within Italy. The analysis was first conducted at the OECD level, so as to highlight international education best practices, taking into account a number of determinants of pupils' achievements. This analysis was repeated separately on the Italian sample alone, so as to assess whether there are significant differences among the main drivers of educational outcomes between the OECD as a whole and Italy. A third analysis focuses on Italian regional disparities in educational achievements and aims at assessing whether and how educational policies should respond to these differences and how they should better adapt to local contexts.

Illustrative results from these two analyses are shown in Figures 8 and 9 (see Annex 4.A1 for detail on the estimation). Figure 8 shows the impact of the main determinants of PISA scores in the OECD sample and in the Italian sample. Figure 9 shows the relative contribution of PISA score determinants to the overall explained variance of PISA scores. The figure reports the results for the overall Italian sample and separately for the North and the South.

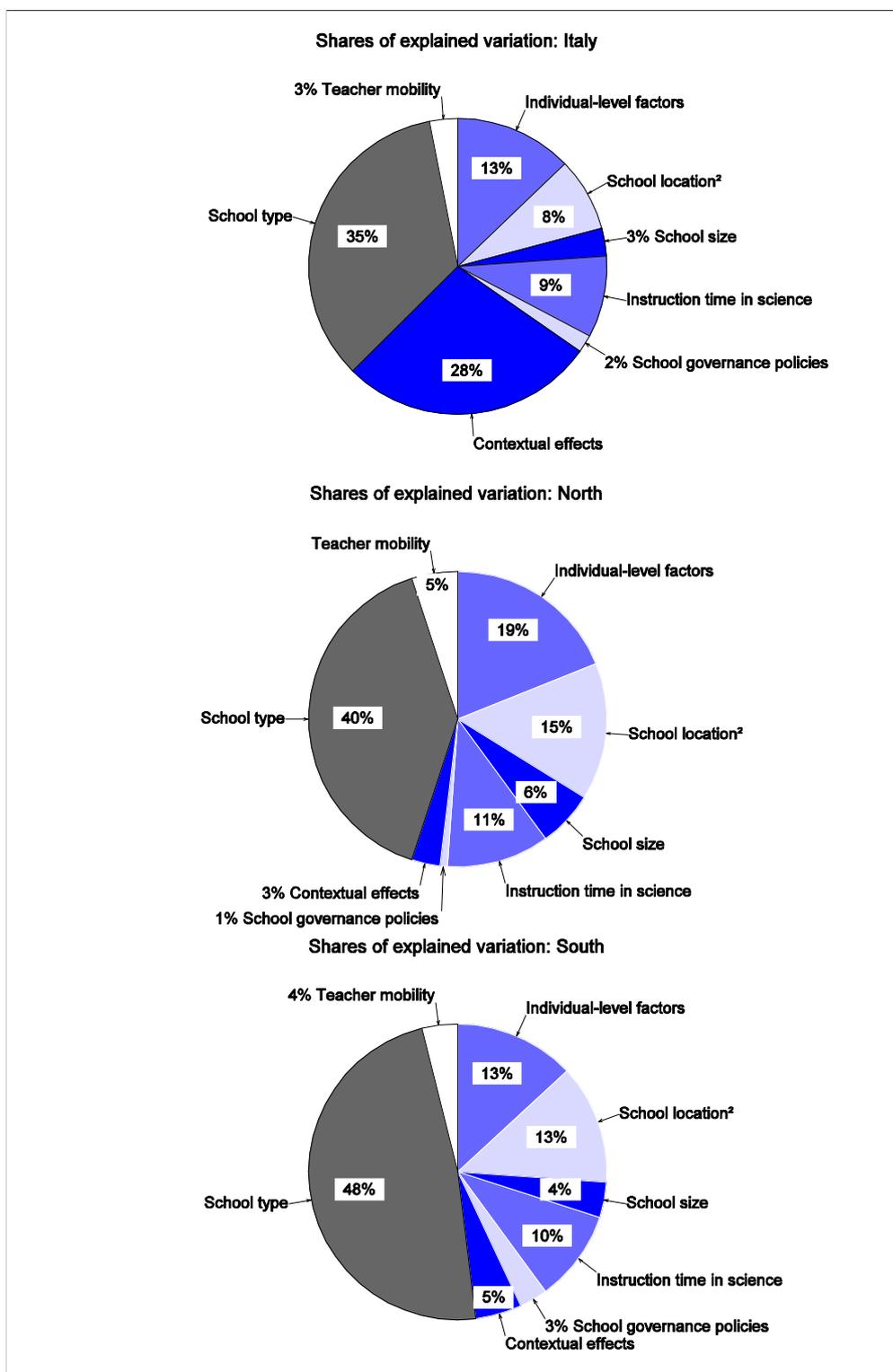
Figure 8. What matters for educational outcomes?



- The two figures show the standardised coefficients obtained when regressing PISA scores on a number of individual and school-level variables (see Annex 4.A1, Table A.A1.2, Columns 1 and 2). Standardisation is obtained by multiplying the regression coefficient by the standard deviation of the explanatory variable, if the latter is continuous (this is indicated by an asterisk close to the variable) or dummies variables, coefficients shown correspond to those directly obtained in the regressions. All coefficients that in the regressions were not significantly different from zero were set to zero. Coefficients read in terms of PISA points: for instance the fact of speaking the national language increases PISA scores by 26 points in the OECD area and 33 in Italy. Fuller information on the regression results, with robustness analysis around the baseline specification, is given in Annex 4.A1.

Source: OECD calculations.

Figure 9. Explaining educational outcomes: the North and South are not so different



1. The charts decompose the total variance explained by the regression model into the relative contributions of the main sets of explanatory variables. Each part of the pie is calculated as the partial R² of the regression for a specific set of explanatory variables.

The regression model for Italy in Table 4.A1.3 Column 1; details of the other results will be available in a working paper.

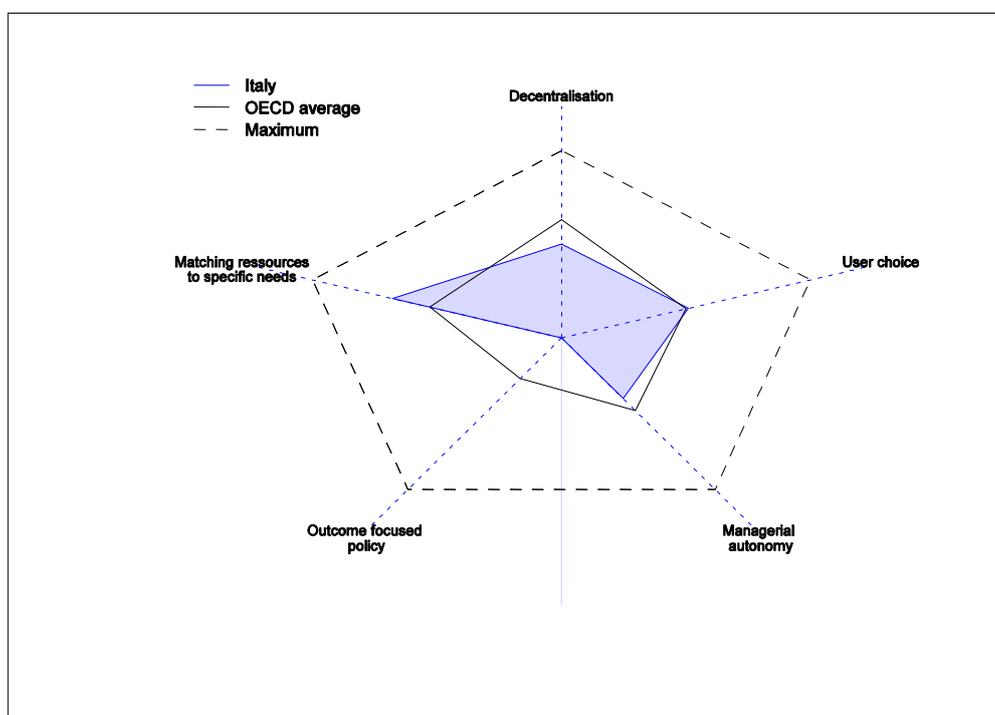
2. School location and average socio-economic background.

Source: OECD calculations.

The most important drivers of PISA scores are individual characteristics related to family status and origin. The number of instruction hours in science also matters a lot for attainment in science. School-governance policies, such as accountability and autonomy, matter but explain less of the overall distribution of performance, especially in the OECD-level analysis. In the national sample, regional fixed effects, school location and school average socio-economic background are the strongest determinants of PISA scores in Italy (Figure 9). School governance policies again explain less, but their influence is similar across the country. The influence of the type of secondary school is strong and captures a lot of the influence of school average socio-economic background, especially in the South. Teacher mobility (defined by three indicators: teacher turn-over; exit rate from a given school; willingness to move to a given school), intended to proxy the quality and the continuity of the teaching environment, also affects pupils' results. Estimates of the effect of both upper-secondary school type and teacher mobility should be interpreted with caution, as they may be endogenous to pupils' ability. The annex discusses this issue more in detail.

41. Current regulations do give school principals some notional autonomy. But, as discussed in the following sections, they do not in practice have the freedom they would need to manage their schools so as to improve results. Furthermore, Italy lags behind other countries in autonomy, but even more so in accountability (Figure 10). Schools must be made accountable for their results, to ensure that autonomy is used for the sake of increasing performance.

Figure 10. Italian schools have relatively little autonomy and accountability



Source: OECD, Gonand *et al.*, Economic Department working paper no. 543, 2007.

Regional variation and weak vocational education: treat results with care

42. Certain regions, and certain types of school - those concentrating on vocational education and training (VET) programmes - are associated with poor results. To help interpret this and other patterns in the data, a similar econometric analysis to that discussed above was carried out separating the country into two macro-areas (North versus Centre and South). Contextual variables, such as local labour market conditions and crime rates, explain a considerable part of the disparities in performance. The contribution of education policy-related variables to variation within the two regions is very similar (Figure 9 and Annex 4.A1). This suggests in turn that institutional settings are quite similar across regions, with no

region specialising in best-practice management, despite the existence of some statutory autonomy in running schools. Unfavourable socioeconomic and other contextual effects are better explanations of poor performance in certain parts of the country than variations in school governance. However, the analysis may omit other variables capturing school management and organisation which could be relevant to the Italian context (see Paletta, 2007).

43. The analysis of the Italian sample also shows that pupils in VET schools (of various orientations) perform substantially worse than peers attending general programmes (see Annex 4.A1): in fact the type of school attended is the next most important driver of PISA scores after regional location. This is in line with OECD (2007), which shows that the earlier a system segregates children between general (*i.e.* academically-oriented) and vocational education and training (VET) programmes, the worse is the overall average performance (*i.e.* taking both VET and general programmes together). Likewise, a longer instruction time in science, which is also a feature of general programmes compared with VET ones, also brings better results.

44. However, VET programmes tend to attract weaker students, so that one cannot simply interpret the statistical effect of attending a VET school as an indication that these programmes are of a lower quality. In fact it is quite likely that the direction of causality is twofold: VET schools have to educate pupils with lower skills but, at the same time, VET schools offer a less good education because better teachers are not attracted to such schools (Barbieri *et al.*, 2007) and possibly because the depth of curricula is not as satisfactory as in the academic upper-secondary schools. Overall, since it is very difficult to disentangle these two directions of causality, policy makers should be aware that VET schools are probably attracting students with learning difficulties, but not providing them with enough tools to overcome those difficulties.

This discussion and the empirical analysis suggest a number of policy implications:

1. Mechanisms (such as seniority-based choice) that allow teachers to select their school but where schools cannot choose teachers (see below), should be removed. The statistical analysis shows that teacher mobility can be bad for performance, and the discussion highlights how more experienced teachers may avoid VET schools if they can.
2. Following the research on the influence of tracking, the first two years of upper-secondary education should follow a common track in all schools, specialising only in the last three years. This would reduce variation in pupil results and increase the overall average level of attainment.
3. While free choice for upper-secondary schools can increase competition among schools and ultimately their quality, it would be desirable to introduce orientation policies for pupils choosing between VET and other types of school to take into account their aptitude and ability (rather than simply residential criteria or families' perhaps uninformed requests), and to provide low-income high achievers the same choices as their more advantaged peers.

Specific policies may be needed for low-performing schools

45. The overall education reforms discussed so far and developed further below should improve outcomes in most schools. But there will still be some schools where they do not work, or which operate in such critical conditions, mostly in central and southern regions, that it is unlikely that they will be sufficient. Reforms that increase autonomy and accountability, though they should be applied to these schools as much as to the rest, might not be sufficient to compensate for their initial disadvantage. To protect pupils in such schools, mechanisms are needed to identify and respond to the problem. This might take the form of extra resources, either from central government or regional government, including the possibility to recruit highly-qualified teachers as well as restructuring: for example, the appointment of a

new principal as well as the specification of targets, means and timing to achieve them. When schools continue to fail pupils, even after the adoption of various remedial actions, their closure should be envisaged, with the pupils being transferred to other schools.

Introducing schools' incentives to performance

The lack of evaluation hinders performance

46. Making schools accountable is impossible without adequate information. This is needed to provide feedback to both pupils and teachers on how well pupils are learning; without it, fixing incentives for schools to pursue the goals set by the education system (average performance, equality of learning opportunities, social cohesion, etc) is largely impossible. Increasing attention has been given in the literature to the forms under which feedback is provided to the various actors in the education system (Box 5). While most agree that providing feedback is a key condition for improvement, it is still controversial how evaluation should be carried out in practice and what consequences should be attached to it.

Box 5. Relation between feedback arrangements and schooling outcomes, some results from the literature

Arrangements	Effect on Quality of Outcomes	Effect on Equity of Outcomes
Curriculum-based external exit exams	Strongly positive	Benefits low SES students, but benefits high SES more.
Use of assessments for decisions about retention and promotion	Strongly positive	Neutral; benefits low SES students in the same way it benefits high SES students.
Use of assessment for grouping students by ability and performance	Negative	Neutral; benefits low SES students in the same way it benefits high SES students.
Monitoring of teachers by school heads/senior teachers	Positive	Benefits low SES students, but benefits high SES more.
Regular standardised testing	Positive in presence of exit exams; negative otherwise	Neutral.
Subjective assessment by teachers	Slightly positive	Benefits low SES students more than it benefits high SES students.
Benchmarking of school performance against that of other schools, district and/or national performance	Positive	Neutral; benefits low SES students in the same way it benefits high SES students.

Note: SES is socio-economic status.

Source: The table is reproduced from OECD 2008f, based on Wößmann *et al.* 2007a and 2007b.

OECD countries display a diversity of practices for taking stock of educational performance, which can be grouped into five categories (OECD 2008f): external standard-based examinations at national level (usually at the end of an education cycle), national and international assessments, external evaluation/inspection (at national or regional level) of schools, internal evaluation of schools, assessment tools developed by teachers. Italy has very few evaluation tools at the moment (Table 3). The few that exist have no influence on schools, teachers or (for the most part) pupils.

Table 3. Italy has few school or pupil evaluation tools

	Final examination at the end of lower-secondary level	National periodical assessments in your country?	Requirement for school evaluation/inspection	Requirement for school self evaluation
Australia	no	yes	1 per 3 years	1 per year
Austria	no	no	none	none
Belgium (Fl)	no	yes	1 per 3 years +	none
Belgium (Fr)	m	m	m	m
Canada	m	m	m	m
Czech Republic	no	no	1 per 3 years	1 per year
Denmark	yes	no	m	m
England	no	yes	1 per 3 years	1 per year
Finland	no	yes	m	m
France	yes	yes	m	m
Germany	m	m	m	m
Greece	m	m	m	m
Hungary	No	yes	a	1 per 3 years +
Iceland	Yes	no	1 per 3 years	1+ per year
Ireland	yes	no	1 per 3 years +	none
Italy	Yes*	Yes**	none	none
Japan	no	no	m	m
Korea	no	yes	1 per 3 years	1 per year
Luxembourg	no	yes	none	1 per year
Mexico	no	yes	m	1+ per year
Netherlands	no	no	m	m
New Zealand	No	no	1 per 3 years	1 per 3 years
Norway	yes	yes	m	none
Poland	m	m	m	m
Portugal	Yes	no	1 per 3 years+	1 per year
Scotland ¹	yes	yes	1 per 3 years+	1 per year
Slovak Republic	m	m	m	m
Spain	no	no	none	none
Sweden	no	yes	1 per 3 years +	1 per year
Switzerland	no	no	m	m
Turkey	yes	yes	1 per 3 years	1 per year
United States	m	m	m	M

Notes: * Italy does not have however **fully external standard-based national** examinations (exams are prepared and run by teachers and so differ across schools).

** Currently, national periodical assessments in Italy are done only on a **voluntary** basis because of the lack of a legal obligation for the school to participate.

m: data is not available.

Source: EAG 2008, Table D5.1, D5.2 and D5.5.

47. The only systematic evaluation of pupils' attainment comes in examinations at the end of lower-secondary and upper-secondary levels. However, while all children across the country are subject to examination at these times, lower-secondary exams in particular are not standardised across the country. The Ministry of Education provides schools and teachers only with general guidelines about the objectives of the exam and the curricular objectives that it should test. Exam standards (for both preparation and grading) remain in the hands of schools. In 2008, however, the lower-secondary exam included, as a pilot, a national standardized test, in addition to the traditional written and oral examination. The standardized test from the year 2009 onwards will account for one fifth of the overall final score (Box 6). Another

limitation of the current system is that while passing the lower secondary exam is necessary for access to upper-secondary school, grades have no impact on the choice of school.

Box 6. Results and lessons from the first national external standard-based exam at the end of lower-secondary education

In the school year 2007-2008, the law introduced an additional, standardised test in mathematics and Italian to be run at the end of lower-secondary school. The test was prepared and administered by the national agency for evaluation of the education system (INVALSI); INVALSI was also responsible for preparing a final report and returning detailed information on the results of the exam to every single school at class level. As for the other national exams, the test was supervised by a board of examiners, composed by school's teachers and an external member acting as president.

While most welcome in principle, the test was only partly successful in practice. Since examiners did not exert strict control over the administration of the test, many schools helped students with the test (see INVALSI, 2008). In addition, many schools did not take into account the results of this test in the matriculation grade (the Ministry of Education having left them with the freedom of considering or not the results for the matriculation grade). However, as from the school year 2008-2009, schools have the obligation to have the standardized test counting for one fifth of the final grade.

The experience of other countries has shown that, to avoid cheating in high-stake tests, it is of the uppermost importance to clearly communicate the purpose and the nature of this test to schools, as well as to undertake a previous consultation on its actual modalities and the consequences that would be attached to it. From this preliminary experience a certain number of conclusions can be drawn:

- It is necessary to fully explain the rationale and the implications of the exam to schools and to consult schools and teachers' organisations on test content.
- The external examiner and the school's teachers should be held responsible for unfair administration of the test.
- Specific follow-up to schools with mediocre results should be provided. Teachers should be given training on how to use feedback received from this test to improve performance.

48. Unlike the earlier exam, the upper-secondary education final exam is the same for all candidates (according to educational programme they are following). However, it is not assessed by a fully external commission; unlike in most other OECD countries, pupils are largely assessed by their own teachers. The scope of the exam is also restricted to a few disciplines while in many other countries it covers almost all subjects studied. It is therefore not surprising to see that results at this exam are not in line with those from international assessments, with little variation across regions and educational programmes (*La scuola in cifre, 2007*).

49. To improve information it will thus be necessary for lower and upper-secondary exit exams to be fully set with national standards and external supervision and grading. For lower secondary, this means that improvements on the 2008 exercise must be made, by putting in place: *a*) external, fully-independent administration of exams (e.g. in written exams this can be reinforced by the anonymity of assessors); that would imply a new, specific law; *b*) sizeable investment in the school administration of exams and in the follow-up expected from results to the exams; *c*) sanctions to be imposed on opportunistically behaving schools. Matriculation exams at the end of upper secondary education should possibly be extended to cover more subjects and must in any case be graded by external evaluators.

50. National assessments have been undertaken in recent years, since the national quality assessment agency INVALSI was instituted.¹² There has been increasing involvement of schools but evaluation

12. Overall there have been 7 national evaluation tests between 2001 and 2007, in some years on all schools and in others on a sample. Before 2007, tests were conducted in the 2nd, 4th, 6th, 9th and 11th grades. In

procedures remain imperfect because participation is on a voluntary basis (due to the lack of legal obligation for schools) and because additional resources would be needed to prevent opportunistic behaviour, through for instance recruitment of external test administrators. In addition, in order to compute value-added indicators, it would be important to test students at the start and the end of an education track. Due to the three-level structure of the Italian system, an accurate measure of value-added would require testing pupils at six points in time. Because of its cost and the possible assessment fatigue this would imply, the number of tests should be set at the minimum (for instance four levels or three if value-added indicators are calculated for secondary education only). It is important that national assessment tests are continued, intensified if possible and conducted on all schools, if they are to be used to give feedback to practitioners. All in all, it is necessary to increase the financial and human resources of the evaluation agency as well as to strengthen its independence from the Ministry of Education, as suggested by the White Paper. To spread a wide acceptance of an evaluation culture, the contents and modalities of national assessment tests should be discussed and possibly agreed with school representatives and school trade unions.

51. Around one third of OECD countries have a national or regional agency that regularly inspects schools. No such agency exists in Italy. Where there is little autonomy or accountability at school level a central inspectorate would serve to monitor both teaching quality and efficiency in the management and administration. It can help the educational authorities to identify weak schools in order to provide them with tailor-made support. An alternative is to encourage schools to engage in self-evaluation: defining objectives and the strategy to reach them; relating specific schools' objectives to the system ones, as specified by national curricula; and provoking an internal discussion among school staff to reflect upon areas of improvement and of professional development. Such methods are quite widespread in the OECD, though often without statutory criteria on the procedures to be followed. Nevertheless, the objectives and the benchmarks that schools must meet are nearly always spelt out (OECD 2008f).

52. In Italy, two pieces of regulation encourage self-evaluation practices.¹³ In particular, the Regulation on school autonomy states that schools are free to choose the criteria for periodic assessment of the goals established by the school plan (Piano dell'Offerta Formativa, POF). This assessment is exercised by the teachers' board, headed by the principal. The school plans should in principle set the actions necessary to fulfil schools' context-specific goals, while remaining in line with national guidelines on goals and methods. They are meant to be a tool to help schools use their own discretion on a number of curricular matters such as optional disciplines taught and instruction time but in practice they seem to be a meaningless exercise in many Italian schools (Madama and Maino, 2007). The Ministry of Education has not systematically monitored the plans in recent years, although wide-scale monitoring was carried out in the early years of their implementation in collaboration with the agency for Educational Innovation and Research (INDIRE); thus, there is the concrete risk that schools may see them more as a burden than as a useful tool, probably because the advantages are obscure to most teachers and families and the consequences of ignoring them are minimal.

53. In these conditions school development plans should either be reformed or abandoned. Reform could be part of a programme to increase accountability. This needs to help school management to take stock of pupils' progress and to encourage them to participate more actively in the definition of assessment

2007-2008, the test was replaced by new sample-based pilot on six grades (2nd, 5th, 6th, 8th, 10th and 13th). The tests assessed competencies in Italian, Mathematics and Science. The tests used multiple-choice questions, with open questions in some years, prepared by a panel of teachers, university professors and INVALSI researchers. The administration of the tests was internal to the school (except in 2007). It is not possible to compare pupils' results over time or across grades.

13. These two pieces are Carta dei Servizi Scolastici (issued through DPCM of 7 June 1995) and the Regulation on school autonomy (DPR 275/1999).

methods, aiming to standardise assessment across teachers and to benchmark on national or international examples of best-practice. Equally, developing national or regional capacity for school inspection could be designed to support both accountability and internal evaluation. A national inspectorate would be best placed to monitor variation in regional performance if this is a concern once the new fiscal federalism arrangements are in place.

Improving teaching quality

54. Although it is clear that teaching quality matters above everything else for achieving good educational outcomes, it is not easy to identify good teachers and teaching methods that give the best results. A widespread view is that the initial qualification of teachers is a necessary but not a sufficient condition for good teaching. Professional experience and continuing professional development over the career are also important factors, but the most crucial element seems to be the motivation to teach and to help pupils improve through time. Generally speaking, the motivation of Italian teachers seems to be relatively weak, the result of inadequate policies and institutional settings. This section analyses how these policies and settings need to be changed to get the most out of teachers' skills and abilities.

Composition of the Italian teaching workforce and the link with teaching quality

55. The average age of Italian teachers is above the OECD average, and there are more women (OECD 2008a, see also Barbieri *et al.*, 2007). These two features have no clear implications on the average quality of Italian teaching: an older workforce is more experienced, but may also be less qualified and less able to satisfy the needs of new generations. The share of women teachers is not linked with educational outcomes, but the increasing feminisation of the Italian labour market may have resulted in a female brain-drain from the education sector, traditionally a sector where the most gifted women would work (Hoxby and Leigh, 2004, establish this for the United States). This seems to be particularly true for teachers of scientific subjects as respect to teachers of literary subjects (Fondazione Giovanni Agnelli 2009). In addition, the compression of teachers' wages *vis-à-vis* that of other professions may also have affected average teacher quality in Italy.

56. Cross-country statistics on the qualification of teachers are not available. However, it is likely that, as for the population as a whole, Italian teachers lag behind in terms of human capital. According to Barbieri *et al.* (2007) 41% of teachers have no more than an upper-secondary education; low educational attainment among teachers is more prevalent in the South than in the North. Only 27% of primary school teachers have more than an upper-secondary diploma; this reflects different formal access requirement to the teaching profession for different grades taught but does not necessarily result in lower teaching quality.¹⁴ Teachers have better graduation marks than average, suggesting that their human capital is above average, at least. There is also some evidence that the proportion of teachers with a lower initial socio-economic background is rising (Cavalli 2000). This trend is common in other OECD countries; while its implications for teaching quality are not clear, it is possible that it is associated with a loss of self-perceived prestige attached to the profession, also frequently reported in other OECD countries.

14. Barbieri *et al* (2007) note that the different level of initial qualification across grades does not imply a corresponding quality gap, because while educational tracks for primary teachers are shorter, they tend to be much more specialised and chosen at an earlier stage, indicating a strong motivation for joining the profession. Secondary education teachers, however, generally opt for the teaching profession only after graduation because of very low opportunity cost and not because of a specific professional vocation.

A relatively low-profile profession...

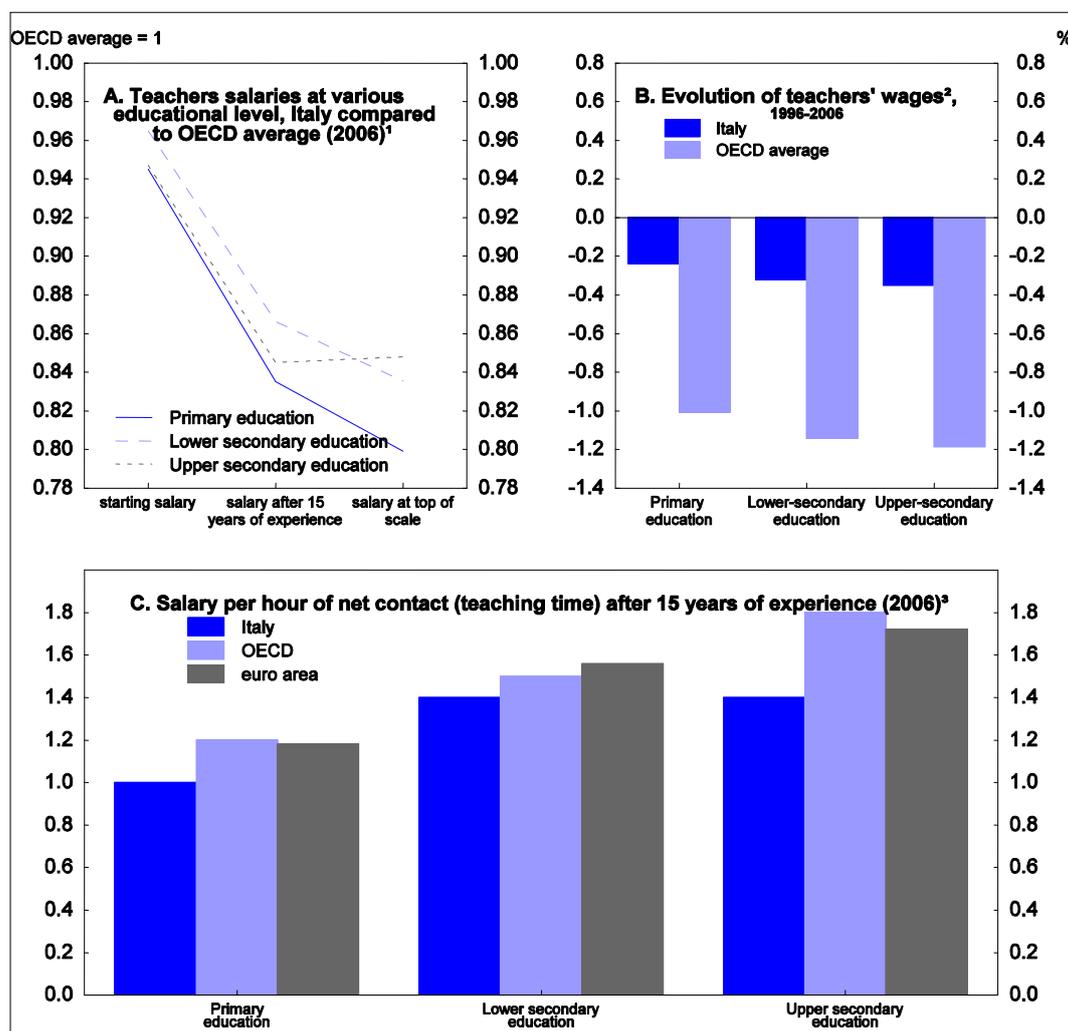
57. Italian teachers are less well paid than their average OECD counterpart (although the gap has declined somewhat over the last ten years), in absolute terms, with respect to GDP per capita and on a per hour basis. This is true at all educational levels taught and at various points of their career (see Figure 11; see also OECD 2008a). The largest differences are for more experienced teachers and for those in primary and upper secondary schools. They also typically earn less than Italians of similar levels of education in other professions, though this gap too has recently been declining slightly. Finally, because teachers are paid under a national contract that takes no account of the lower cost of living in the south, real wages are lower in the North than in the South; however, the cost of living has been rising faster in southern regions.

58. In most OECD countries, teachers' wage structure is quite flat (OECD 2008a). In Italy this wage compression is particularly strong. Salary increases depend on a very narrow range of factors (e.g. teaching in a disadvantaged, remote or high-cost area, or some involvement in management responsibilities - though this only results in a small additional incidental payment, which is often paid late). In some countries (e.g. the Netherlands, Denmark and Finland) teachers' wages are based on a larger and more diversified number of criteria, resulting in higher wage differentiation along teachers' careers and according to effective responsibilities taken. This arguably creates stronger incentives for the profession as a whole.

59. Another crucial aspect in comparing the relative attractiveness of teaching across OECD countries is contract and career stability. The number of teachers with temporary (sometimes very short¹⁵) contracts has increased significantly in the last ten years, especially in primary and lower secondary education: the ratio of fixed-term to tenured teachers has tripled. There are now four tenured teachers for every teacher on a temporary contract; in other professions the average is around 6 to 1, and for the economy as a whole it is about 8 to 1. This suggests somewhat more "precarity" in teaching than elsewhere, and its degree has also risen faster than the average. But without systematic comparative data for other countries, and given the high degree of job security once tenure is obtained (see below), it is not clear whether this is a major problem for recruitment of good teachers.

15. There are three types of temporary contracts in Italy: those lasting a full calendar year; those lasting one school year (with no pay over the summer) and those between fifteen days and one school year. The first two are signed at central level, for vacancies due to sickness and also to cover the gap between the number of tenured positions and actual teaching positions. This gap is due to constraints on public finance that prevent the ministry of education from filling all posts with teachers on permanent contracts.

Figure 11. Italian teachers' wages are lower than the OECD average, but the gap has been closing



1. The panel A shows the ratio of normalised wages for Italy to normalised wages for the OECD area as a whole, where normalisation is obtained by dividing wages by GNP per capita. The chart reads as follows: in primary education the top salary in Italy is 20% lower relative to GNP per capita than in the average OECD country, while in lower and upper secondary education the top salary is respectively 16% and 15% lower in Italy than in the average OECD country.
2. The panel B shows the change of normalised wages (i.e. divided by GNP per capita) for Italy and for the OECD area between 1996 and 2006. The data refer to a teacher with 15 years of professional experience.
3. The panel C shows teachers' hourly wage divided by average national productivity, measured as GNP/(hours*employed), for Italy, the euro area and the OECD area.

Source: Education at a glance, 2008.

60. Apart from financial and contractual considerations, teachers' careers are not attractive by international standards (OECD, 2004, and OECD, 2008a). Formal professional development is relatively limited in Italy, being neither compulsory nor required for promotion. Teachers have to bear the cost of training, including leave, since there is no statutory research or training leave (OECD, 2004, Table 3). This situation is very different from that of other OECD and non-OECD European countries, where in-service training is part of teachers' professional duties (e.g. Finland, the UK, Germany) or is at least required for promotion (France, Sweden). Overall, there are no specific initiatives taken at central or at school level for encouraging teacher participation in continuing professional development activities (OECD, 2004; Eurydice, 2008).

61. There is no single best-practice model for teaching career structures, with countries adopting a variety of approaches (OECD, 2004). However, an important common feature is that a teaching career is divided into different stages, each of them associated with a different range of responsibilities and corresponding financial rewards. Progression across stages is not automatic but made contingent on a specific evaluation, often requested by the teacher herself. Professional prestige or the enjoyment of the working environment can be important factors behind the decision to enter teaching, but comparative evidence on this is not conclusive.¹⁶ Propositions in the draft “Aprea” law may go a long way to improving the situation if finalised in the law (see Box 3).

...with weak recruitment procedures

62. Teacher recruitment procedures lack transparency and rigour, by international standards. The main formal channel for obtaining a tenured position is supposed to be a competitive national examination (which does not, however, assess teaching ability). In practice this is held extremely irregularly (it may be nearly 10 years from one to the next), success does not in itself guarantee an immediate permanent contract and in practice the majority of teachers are recruited locally, initially with fixed-term contracts. Tenure is eventually obtained after several years of waiting and continual movement from school to school.¹⁷ These procedures neither encourage good quality applicants to the profession nor reward good teaching performance or motivation, failings recognised in the 2007 White Paper on education and the Spending Review (2008). With the exception of France and Korea, teachers in all other OECD countries are selected through open recruitment procedures. These vary quite considerably from one country to another and can be centralised or managed by the schools themselves. They often involve screening candidates based on many factors, including academic performance, prior experience, motivation, interpersonal and other skills (OECD 2004, Table 2). OECD (2004) shows that these factors are all important for teaching effectiveness. OECD experience also shows that hiring at school level – with accountability - makes it easier to select the right teachers for the school and the neighbourhood.

63. A survey of Italian teachers’ views on working conditions suggests that more rigorous recruitment could strengthen professional commitment (Cavalli, 2000). Teachers regretted not having received very rigorous training and were worried that a lack of entry selection to the profession undermined the value of the profession itself. The same survey also showed that teachers were in favour of decentralisation and autonomy and of periodic teacher evaluation. However, there was clear opposition to having this carried out by external evaluators or through direct observation of teaching.

64. Raising initial training and selection requirements, with better organisation of induction programmes for new teachers (currently only formally required for tenured teachers), and provision for

16. Although there are very few comparable data on this, the general view is that teachers have been subject to loss of prestige and increasing distrust from society. This seems to have happened in most of OECD countries however, nothing distinguishing Italy in this regard. With respect to the characteristics of the working environment, PISA 2003 data suggest that learning environment of Italian schools is less enjoyable and objectively less straightforward (in terms of pupils) than in other OECD countries, which would indicate a lower “consumption value” from teachers in Italy compared with those in other OECD countries.

17. In 1999, secondary education teachers’ colleges (Scuole di Specializzazione per l’insegnamento nella scuola secondaria, SSIS) were created to replace the competitive examination recruitment procedures with a more rational track from tertiary education to the profession. The training would include traineeship in schools and theoretical specialisation in the relevant subject. Graduation from these colleges would allow students to qualify for competitive examinations (without going through previous selection) to join national candidates lists by discipline and to be called for temporary replacement teaching positions. The recent Law 2008/133 suspended the access to these schools for the year 2008/09, remaining silent on what the recruitment procedure would be in the future.

continuing training are necessary for raising professional standards. This would no doubt bring improvements even if the current centralised recruitment system were retained. More benefit would be obtained if it were introduced along with well-aligned accountability and autonomy in recruiting at the local level, as discussed below.

Low incentives to keep up motivation and skill updating

65. The strong job security enjoyed by tenured teachers appears to be an important reason for entering and remaining in the profession (Giavazzi, 2008). Most teachers eventually obtain a job for life, without ever undergoing any performance assessment (Table 4). They can be dismissed only for disciplinary reasons; unlike in the majority of OECD countries, neither underperformance nor redundancy are valid grounds for dismissal.¹⁸ There is no procedure to handle ineffective teachers¹⁹ and principals have no formal means to influence performance. With great freedom in pedagogy yet subject to little evaluation, Italian teachers can afford to do very little and yet never be sanctioned.

Table 4. Teachers in Italy are not subject to any kind of evaluation

	Teacher inspection on an individual or collective basis	School self- evaluation	Individual evaluation by school heads	Individual evaluation by peers	No evaluation
Belgium	•		•		
Czech Republic		•	•		
Denmark	•				
Germany	•				
Ireland	•	•			
Greece	•		•	•	
Spain	•				
France	•		•		
Italy					•
Luxembourg					•
Hungary		•	•		
Netherlands			•		
Austria	•	•	•		
Poland			•		
Portugal	•	•	•	•	
Slovakia	•		•	•	
Finland					•
Sweden	•	•			
England and Wales	•				
Scotland	•	•			
Iceland		•			
Norway			•		

Source: Eurydice.

18. See OECD (2004), Table 1.

19. With the rare exception of when they are the subject of a complaint. Even in such cases, their assessment may be left to the principal rather than to an external body. Teachers enjoy a large amount of pedagogical autonomy, being free to choose the content of optional subjects, teaching methods and textbooks. They have freedom to decide the criteria for the internal assessment of pupils and also, up to the end of lower-secondary, for preparing and carrying out matriculation exams. Most European peers have only a limited autonomy or no autonomy at all in assessment and examination of pupils (Eurydice, 2008).

66. Teachers are allocated to schools based on seniority, so they have little influence on where they go until late in their career. They spend the beginning of their career working under temporary contracts and changing schools each year, getting tenure only after several years of this. But from then onwards they cannot be dismissed or moved to another school without their explicit consent. Schools can neither influence the Ministry's decisions nor refuse the teachers assigned to them.

67. Empirical analysis suggests that this allocation mechanism is inefficient and has a negative effect on teaching quality (Barbieri *et al.*, 2007). In particular, high turnover results in teaching discontinuity from one year to another and the likelihood of a move reduces even well-motivated teachers' incentives. About half of teachers move from one school to another each year: about 30% of those in primary schools, 60% in upper-secondary school. Adjusting for possible structural determinants of turnover (e.g. share of temporary contracts, gender, and age), turnover is found to be the highest in southern schools and in technical and professional upper secondary schools; such schools might thus suffer more from lack of teaching effectiveness. Empirical analysis also suggests a high degree of mismatch between teachers and schools; almost 18% of teachers wish to leave their school on average, especially in the South and VET schools. Teachers seem to prefer northern schools to southern schools, and also prefer the more academically oriented schools.

68. These results cannot prove that the current policy for allocating teachers to schools results in ineffective teachers' performance, but the revealed high degree of dissatisfaction and high mobility strongly suggest it.²⁰ The rising share of temporary contracts among teachers, a policy to enhance flexibility but one that likely also increases teacher mobility, is also probably detrimental to pupil performance, in the absence of performance evaluation. Taking job performance into account when allocating teachers to their preferred schools could provide an incentive that might partly offset the cost of high turnover. Ideally, schools themselves should have the authority to hire teachers, choose between offering a temporary or a permanent contract and undertake independent performance evaluation. Of course, schools themselves should be held accountable for their own performance.

How should teachers be evaluated?

69. Teachers' evaluation may take different forms. It may be direct assessment of teachers' results by the principal (e.g. Belgium, Spain,) or the inspectorate (e.g. Denmark, Sweden, France); indirect assessment based on pupils' results in national examination or national assessment tests (Australia, Netherlands, Sweden); or a direct test of teachers' abilities and skills at the beginning of their career (United Kingdom, United States) or later on (United States, some Canadian provinces, Chile). Most countries undertake an annual evaluation of all teachers, and some combine different evaluation procedures (see OECD 2004) or diversify the recipients and frequency of evaluation (e.g. in the United Kingdom all teachers are assessed periodically by the principal but teachers may also apply for a voluntary external evaluation for promotion). Evaluation tools are diverse, but they mainly comprise classroom observation, documentation on the teacher, interviews and pupils' learning data.

70. Procedures using pupils' results over time to build up "value-added" measures of teachers' and schools' contribution to pupils' learning are attractive, though at first sight expensive, evaluation tools. Since many aspects of a pupil's progress reflect teaching teamwork, they can be difficult to apply on their own to individual teachers, but this difficulty can be reduced if they are used to evaluate teams. OECD (2008b) shows that value added indicators can in the end be very cost-effective, because of the accurate information flow that they can provide; such benefits justify the investment in the long run.

20. The empirical analysis carried out in Annex 1.A1, which makes use of similar indicators to those in Barbieri *et al.* (2007) for more recent years, corroborates the conclusion that high mobility of teachers and dissatisfaction with the school working environment are detrimental to pupils' performance.

71. Periodic recertification of teaching abilities is an alternative evaluation procedure. Through teacher recertification, currently a practice in the United States, in Canada and in Chile, teachers regularly renew their teaching licence. Renewal is conditional on proving that the teacher has obtained positive assessment in performance evaluation and/or has taken part in professional development courses (see OECD, 2004). It can be costly if a specific certification authority has to be created, but less so if it is handled by existing teachers' colleges or universities. Introduced on a voluntary basis, recertification would be taken up by high achievers aiming at promotion; this reduces costs and facilitates the identification of "virtuous" teachers without compulsion.

72. Given the current absence of teacher performance evaluation, and overall resource constraints, a desirable initial strategy might include both internal and external evaluation tools, using results from national assessment tests and reformed national examinations, as well as principals' judgement. A recertification procedure might be a useful addition, provided that existing institutions can be used reliably; but it is not clear what recertification might mean, given the absence up to now of any formal initial certification and the suspension of the specialised teacher training institutes (SSIS). The "*di ruolo*" competition might be a model (though not its irregular timing), or the new teacher training system planned under the draft law Aprea could include provision for recertification. In the longer term, Italy should introduce evaluation procedures allowing for the construction of value-added measures, which may progressively replace raw scores from national assessment tests/exams.

73. The current government plan to cut the number of teachers by 10% envisages using 30% of the saving on measures to raise teachers' job profile. Part of this money should be used to introduce teachers' evaluation procedures or refine those already existing at school level, while the rest of it could be directly allocated to reward teaching performance, as the next few paragraphs argue.

What consequences should be attached to teachers' evaluation?

74. Teachers' assessment, based on objective information on their pupils' progress, provides an essential tool for tasks such as planning class programmes and assessing training needs. It could also be used to hold teachers accountable for their performance, with consequences varying from differentiating wages and career development according to performance, compulsory requalification for ineffective staff and ultimately dismissal if no improvement is observed.

75. Although the debate on the effectiveness of performance-based pay is still open, there is some experience that suggests that it can work (OECD, 2008d). Merit pay schemes are not completely new in Italy, a small share of the budget for salaries is allocated by school principals as a function of performance. In practice, the principal has to consult with union representatives in the school; resistance to distribution on the basis of performance is strong and equal distribution of the additional money is the norm. so in fact there is no finding merit-pay system at the moment, and it would be worthwhile considering to introduce one. In this case screening of teachers' work and eligibility for performance pay by the principal should complement other evaluation procedures, but this requires trust in principals from their staff – for which appropriate accountability for principals themselves is a pre-condition.

The importance of school leadership

76. Good leadership is a key asset for schools (OECD 2008k). Principals' profiles are especially important when schools are largely autonomous. In Italy teachers currently wishing to become principals undergo some compulsory form of training once they have succeeded in the open competitions to become principals. However, the effectiveness of this kind of training has never been the object of proper assessment. In addition the current set of responsibilities and rewards for school heads is not attractive. Special training programmes (initial or in-service) should be created to give the appropriate management

and pedagogical tools to leaders, especially in schools with very difficult background conditions. At the same time financial incentives to become and perform as an effective principal should be introduced. In an analogous way as for teachers, a systematic evaluation of principals' performance and progress of their schools is needed. In Italy there are concrete windows of opportunity for implementing a system of school principal evaluation because both the law and the national labor agreements foresee it. INVALSI (2009) has recently put forward a proposal to evaluate principals on the basis of school drop-out reduction and learning achievements. This and other models are being examined at the present by the Ministry.

The political economy of educational reforms: lessons for Italy?

77. The involvement of social partners in designing reforms can help to gain their acceptance. In Italy, trade unions are often consulted "top down" rather than actively putting forward reform proposals "from the grass roots" (Eurydice, 2008). In other countries, even without an institutionalised relationship, trade unions have been crucial players in reforming the working conditions of teachers, as for instance in the United Kingdom.²¹ Decentralisation and school autonomy in Italy have not led to local bargaining of wages and working conditions; there is little support for empowering schools and teachers with the necessary governance tools at school level; local wage bargaining is also absent in other public sector contexts, mainly due to union hostility to this, despite attempts by different governments to encourage it.

78. To build support for significant reforms, it would be desirable for government to engage directly in systematic discussions with both trade unions and schools on the rationale and design of reform. Building on the diagnoses of the 2007 White Paper and the Spending Review (2008), discussion could usefully focus on how different parties (teachers, schools and pupils) stand to benefit. The trade-off between efficiency-focused reforms and teachers' interests may not be as straightforward and negative as teachers fear (see Box 7).

Box 7. Can education reform further the interests of teachers?

Discussion of education reform can be polarised between the apparent opposition between efficiency and teachers' interests. Many teachers and teacher's organisations see efficiency-focused reforms as implying less education spending and ultimately either lower pay or fewer jobs. There is, of course, some trade-off between efficiency-focused reforms and the *short-term* interests of *existing* teachers which it is likely to be counter-productive to deny. Two sets of arguments could soften the perceived opposition between efficiency and teachers' interests:

- By improving the productivity of the education system, efficiency-enhancing reforms can support salary increases of the most deserving teachers. By providing demonstrable information of value for money in education spending, reforms can engender popular and government support for such spending.

This is partly a long-term argument based on the idea that more efficient education produces more human capital, increasing overall productivity and real wages in the economy. It is unrealistic to expect such effects to benefit existing teachers noticeably in any reasonable time-period. However, if it is possible to present reforms in this way, and to ensure a clear link between pupils' performance and recognition for the schools and teachers that contributed to it, popular support for educational spending may be increased.

- There are additional, non-financial benefits to teachers from reforms. Benefits that have been described by some teachers who have worked in systems with such reforms, or reported in economic studies, include: higher job satisfaction; greater flexibility for teachers to work in the most effective ways; better information about successful teaching strategies; the potential to improve social status by highlighting particularly

21. In the United Kingdom an agreement was signed in 2003 by teaching unions, local government employers and the central government to raise teaching standards. The agreement acknowledged that the pressure on schools to raise standards led to problems with teacher workload, with some perverse effects on recruitment, retention and morale. A number of administrative tasks were removed from teachers' responsibilities, and more time was given for planning and preparing teaching and for pupils' assessment.

successful teachers; and, in some countries, broader career opportunities.

These factors should hold for reforms such as increasing school accountability and performance benchmarking, where they are based on collecting and disseminating dispassionate information on educational performance and methods, and where career development is some predictable function of use of this information. But where there are winners there are certain to be - at least perceptions that there are - losers. Successful reforms therefore have to be designed to reward effort and success rather than explicitly to punish poor performance, particularly given the real difficulties in isolating individual teachers' contributions. Sanctions such as eventual dismissal have to be credible, but the process that leads to them has to be seen to be fair.

79. Such suggestions follow the general conclusions of empirical research dealing with conditions which facilitate successful implementation of reforms. While relatively little work has been done specifically on educational reforms, conditions which are relevant both in general and for education include: uncertainty about the size and distribution of costs and benefits of educational reforms; loss of advantages of privileged positions for clearly defined groups of stake-holders; timing, when reforms imply significant up-front costs and delayed benefits.²²

80. In the absence of concrete examples of successful strategies to overcome resistance to education reforms, ideas may be adopted from other contexts. For instance, "PISA shock" – a sense of crisis in the performance of the education system – might be helpful, if going together with a deep study of the underlying problems and possible solutions to overcome them. The need for further integration in the European labour market (encouraging convergence of education and training levels) might be another source of support. Integrated, extensive reforms are generally more successful than piecemeal ones. This would imply, for example, the need to introduce autonomy and accountability at the same time, and to reform teachers' career structure at the same time as introducing merit-based pay or other forms of financial reward. As stressed above, using part of the saved resources under the last Budget Law to finance schemes aimed at enhancing school performance, will make it more acceptable for key actors in the system to undergo a significant restructuring. OECD (2008e) argues that reform strategies are more effective when: *a)* they are accompanied by significant up-front investment in building institutional capacity to make the reform work; *b)* they take into account multi-level governance, by clearly defining respective responsibilities and power, providing for effective coordination between levels; and *c)* they are based on widely disseminated performance data, so as to reinforce evidence-based policy making.

To conclude, to enhance the acceptability of educational reforms, it is necessary to:

- Continue dialogue with the teachers' trade unions, but also interact directly with schools and teachers to promote the principles of reform, making them acceptable to the teaching community. Benefits for teachers and schools should be highlighted where possible, but full transparency on cost and implications of the reform should be preserved.
- Promote informed public debate on the virtues of reform, by reinforcing data collection of educational outcomes and derived benefits and by disseminating these data in appropriate forms. In particular, involve parents in the discussion of the reforms, by promoting the creation of parents' associations at national or local level.
- Adopt an integrated, extensive approach to educational reforms, which includes a number of coordinated and complementary actions, and takes properly into account the various levels of governance as implied by the fiscal federalism structure.

22. See OECD (2008e), Høj *et al.* (2006), as well as the report on the case studies in the Political Economy of Structural Reform project: ECO/CPE/WP1(2008)18 and (on Italy) ECO/EDR/PE(2008)2.

Improving transition from upper-secondary school to the labour market and tertiary education

Too many early school leavers and difficult entry into the labour market

81. Research on school drop-out rates in other countries identifies five sets of factors: school-related factors (schools failing to adapt to the needs of low achievers, inadequate academic and social organisation of schools, etc., Hanushek *et al.*, 2006); student-related factors (lower motivation, disruptive behaviour, lower ability, etc.; Eckstein and Wolpin, 1999); family related factors, either social (unstable family situation, lack of family support, poor education of parents, etc.; Cardoso and Verner, 2006) or economic (credit constraints, higher risk aversion, myopic behaviour; Carneiro and Heckman, 2002; Oreopoulos, 2007). All these factors seem to be at work to some extent in Italy. Dropping-out behaviour appears to be strongly influenced by mismatch between school and pupils, *i.e.* by the fact that the school is unable to fit specific students' needs and the student cannot keep up with the demands of schooling (O'Higgins *et al.*, 2007). The outside labour market clearly makes a difference, dropping-out is relatively common in some northern areas where the labour market is tight since full-time employment may be a rational alternative to education for some, and PISA result are already more satisfactory than in the south. This explanation is less reasonable in the south where the (formal) labour market performs less well and the general environment is not supportive of continued investment in education. According to Montanaro (2008) drop-out rates in the South are in any case lower than they would be if standards for promotion from one school grade to the next were the same as in the North.

82. Some policy implications follow directly from this analysis. An increasing amount of research shows that investment in early schooling boosts children's motivation and ability from the very start, particularly beneficial for socially disadvantaged children.²³ Italy currently lags behind in such provision. It is also possible to introduce specific methods of teaching and formative assessment that are directly targeted at youth with the greater difficulties (Yeh, 2008). Better information on pupils' progress, that could follow from reforms to assessment discussed above, would help to identify children at risk earlier on so as to offer targeted supplemental instruction time or put them in smaller classes (Piketty, 2004; Gufstasson, 2003). All these measures may need to be differentiated according to local conditions. Despite significant progress in terms of secondary school participation rate, the share of early-school leavers is still high, in particular in the South: overall in 2007 about one 18-to-24-year-old out of five had prematurely abandoned education without either achieving an upper secondary school diploma or following any further education or training path, against an EU average equal to 15% and versus a Lisbon strategy target set at 10% by 2010. This rate is about 25% in the South, but has dropped in many southern regions²⁴ over the past three years, which would also be the result of specific policy action under the National Operational Programme (ISTAT 2008).

83. The whole country can benefit from certain policy measures in addition to general reforms to increase evaluation and accountability. As well as increasing participation in early childhood education and care, and providing strengthened support to students at risk of drop-out, career guidance should be provided to students from an early stage of upper secondary education, involving parents and employers too; similarly improved apprenticeship and work-experience programmes in VET schools could be useful. Finally, adult educational policies and policies going beyond the educational realm, by looking for ways to encourage school students to aim for "mainstream" labour market opportunities rather than the informal economy or organised crime, are also desirable even if difficult.

23. See OECD (2008g, 2008h, 2008i)

24. Between 2005 and 2008 drop-out rates have declined from 33.1% to 28,9% in Campania, from 23.7 to 16% in Basilicata, from 32,8% to 27.9% in Puglia, from 43,3% to 31.1% in Sardinia and from 34,8% to 30,9% in Sicily.

Conclusions

84. Raising the performance of the school education system is a major challenge. Current education policy settings contribute to mediocre results: the system lacks a performance culture, with information on performance itself being obscure; few, if any, incentives are in place to encourage schools and teachers to improve performance. These problems are common to all regions: most regional disparities in outcomes seem to be due to factors other than schools' organisation and function. There is room for expenditure savings to be made, but this needs to be done with care, and some of the savings have to be "reinvested" in measures to improve educational outcomes. Lifting average outcomes requires effort in a number of areas. First, accountability has to be strengthened, by improving the existing national evaluation test carried out at school level and by reforming final exams at the end of lower and upper secondary education according to international best practice. Second, specific action to enhance the quality of teaching should also be envisaged. Third, average results can be increased by focusing some attention on improving educational achievement, particularly in VET schools, while at the same time moderating the negative impact of the social aggregation effect in those schools.

85. Successful reform of national policies will improve education everywhere but could, especially with increased decentralisation, exacerbate regional disparities in outcomes. Policymakers and the public need to be aware of this. Closing the education gap between the North and the South is one of the key ways to close the underlying economic and social gap, so measures – which need not have a specifically regional focus – to pick up weaker schools and students, especially those at risk of drop-out, should also be encouraged.

Box 8. Summary of the main recommendations on Education

To contain spending, it is recommended that:

- **Average class size is increased**, by minimizing the number of classes within a school and by merging small schools. This should be achieved by revising upward the regulatory thresholds and by coordinating class formation across schools so as to maximize economies of scales in school network planning.
- **Class size is not increased in schools with very poor results.**
- **Reduction of instruction time is confined to non-compulsory subjects and avoids MST hours**, especially in VET schools.
- **A sizeable proportion of saving obtained by increasing class size and instruction time is reinvested in policies aimed at boosting outputs.**

To improve accountability and autonomy, the following policies should be adopted:

- **Improve external evaluation of schools and providing special support to schools to take stock of it.** National assessment tests should be continued but conducted on all Italian schools. The administration of the test should be with external and fully-independent assessors. National examinations at the end of lower and upper-secondary education should be fully transformed into external exams with national standards.
- **Results of national assessment test and final exams should be published at the school level**, both in raw terms and, more important but also more difficult, in terms of value-added.
- **Periodically evaluate the performance of teachers**, for instance through results of external schools evaluation, recertification procedures, principal's judgment and possibly regional or national inspectorate activity. **Reward outstanding teachers through salary increases and career advancement, provide compulsory training to ineffective teachers and ultimately dismiss the extreme cases.**
- **Provide greater managerial autonomy to school headmasters**, including for the selection, evaluation and career development of teachers. Autonomy of headmasters should go along with accrued evaluation of schools. Further efforts have to be made to fully enforce a system assessing principals, as already foreseen by legislative provisions and collective labour agreements.

To improve teaching and school quality:

- **Strengthen initial qualification of teachers and tighten recruitment procedures**, by increased selection on entry to teacher training colleges and standardisation of certification procedures. **Raise the attractiveness of teaching profession** by promoting teacher professional development, introducing financial rewards based on achievements, providing career development opportunities as based on recertification and performance achieved.
- **Strengthen the ability of school principals to manage their schools effectively by introducing specific training and ensuring the availability of support from sub-national or central administration.**

To improve outcomes in cost-effective but low-performing schools, and to reduce the large regional differences in pupils' performance, it is recommended that:

- **Extra-resources are transferred to those schools** so as to compensate for critical conditions of learning and adverse contextual effects on performance of their schools.
- **Encourage the restructuring of schools with poor score results.** Conditional grants should be accorded on the basis of a substantial restructuring plan for schools, implying for instance the appointment of a new principal and the specification of a set of targets and means to achieve them.
- When schools continue to repeatedly fail pupils, even after the adoption of various remedial actions, their definite closing down should be envisaged and children transferred to other schools.

To increase performance of vocational (VET) schools:

- **A common educational track for the first two years of upper-secondary education should be created or alternatively, the first two years of VET programs be made more generalist.**
- Mechanisms encouraging teachers to self-select into schools should be eliminated. If such behaviour cannot be avoided, **specific incentives should be given to orient good teachers towards poor performing schools.**

To improve performance of the weakest pupils and reduce drop-out rates, it is recommended to:

- **Provide quality early childhood education and care**, especially for children from low-income backgrounds.
- **Provide strengthened support to weak students**, through better teachers and infrastructures, supplementary instruction time and special follow-up in small classes.

Provide career guidance to students from the early stages of upper-secondary education and involve parents in professional orientation plans.

Bibliography

- Barbieri G., Cipollone P. and P. Sestito (2007) “Labour market for teachers: demographic characteristics and allocative mechanisms”, *Giornale degli Economisti e Annali di Economia*, Vol. 66, No. 3, pp. 335-373.
- Bishop J.H. and L. Wößmann (2004), “Institutional Effects in a Simple Model of Educational Production”, *Education Economics* 12, pp. 17-38.
- Bishop J.H. (1997), “The Effect of National Standards and Curriculum-Based Exams on Achievements”, *American Economic Review*, 87 (2), pp. 260-264.
- Boarini R., Oliveira Martins J., Strauss H., De la Maisonneuve C. and G. Nicoletti (2008) “ Investment in Tertiary Education: Main Determinants and Implications for Policy”, *CESifo Economic Studies*, Vol. 54: 277-312.
- Boarini R. and H. Strauss (2007), “The private internal rates of return to tertiary education: new estimates for 21 OECD countries”, *OECD Economics Department Working Papers* No. 591.
- Brandolini A., Cannari L, D’Alessio G. and I. Faiella (2004), “Household Wealth Distribution in Italy in the 1990s”, *Bank of Italy Temi di Discussione* No. 530.
- Bratti M., Checchi D. and G. De Blasio (2008), “Does the expansion of higher education increase the equality of educational opportunities? Evidence from Italy”, *Bank of Italy Temi di Discussione* No. 679.
- Bratti M., Checchi D. and A. Filippin (2007), “Da dove vengono le competenze degli studenti italiani”, Edizioni Il Mulino, Bologna.
- Cardoso A. R. and D. Verner (2006), “School drop-out and push-out factors in Brazil: the role of early parenthood, child labour and poverty”, *IZA Discussion Paper* No. 2515.
- Carneiro P. and J.J. Heckman (2002), “The evidence on credit constraints in post-secondary schooling”, *NBER Working Paper* No. 90955.
- Causa O. and C. Chapuis (2009), “Equity in student achievement across OECD countries: an investigation of the role of policies”, *OECD Economics department Working Paper* No. 708.
- Cavalli A. (2008), “Consigli per vincere la depressione”, *Il Mulino*, 2/2008, pp. 250-258.
- Cavalli A. (2000), *Gli insegnanti nella scuola che cambia. Seconda indagine IARD sulle condizioni di vita e di lavoro nella scuola italiana*, Edizioni Il Mulino, Bologna.

- Checchi D., Ichino A. and A. Rustichini (1999), "More equal but less mobile? Educational financing and intergenerational mobility in Italy and in the US", *Journal of Public Economics*, No. 74, pp. 351-393.
- Colonna F. (2007) "Labour market and Schooling Choice: Italy versus US", paper presented at XXII Annual Conference of the European Society for Population Economics, London.
- Corak, M. (2006), "Do Poor Children Become Poor Adults? Lessons from a Cross-country Comparison of Generational Earnings Mobility", *IZA Discussion Paper No. 1993*.
- D'Addio A. (2007), "[Intergenerational Transmission of Disadvantage: Mobility or Immobility Across Generations?](#)," *OECD Social Employment and Migration Working Papers* 52.
- Eckstein Z. and K.I. Wolpin (1999), "Why youth drop out of high school: the impact of preferences, opportunities and abilities", *Econometrica*, Vol. 67, No. 6, pp. 1295-1339.
- Eurydice (2008), "Levels of Autonomy and Responsibilities of Teachers in Europe", http://eacea.ec.europa.eu/ressources/eurydice/pdf/0_integral/094EN.pdf.
- Ferratini P. (2008), "Tante riforme, nessuna Riforma", *Il Mulino*, 2/2008, pp. 267-275.
- Fondazione Giovanni Agnelli (2009), "Rapporto sulla scuola in Italia 2009", Editori Laterza, Bari.
- Fuchs T. and L. Wößmann (2007), "What Accounts for International Differences in Student Performance? A Re-examination using PISA Data", *Empirical Economics*, Vol. 32 (2-3), 433-464.
- Giavazzi F. (2008), "Scuola, il tabu dei concorsi", *Il corriere della sera*, 15 June 2008.
- Giordano R., Tommasino P. and M. Casiraghi (2008), "Behind public sector efficiency: the role of culture and the institutions", Paper presented at the "The quality of public finance and economic growth" Workshop, Brussels.
- Gonand F., Joumard I. and R. Price (2007), "Public Spending Efficiency: Institutional Indicators in Primary and Secondary Education", *OECD Economics Department Working Paper* No. 543.
- Gufstafsson J. E. (2003), "What do we know about effects of school resources on educational results?", *Swedish Economic Policy Review* 10, pp. 77-110.
- Guichard S. (2005), "The Education Challenge in Mexico: Delivering Good Quality Education to All", *OECD Economics Department Working Papers* No. 447.
- Hanushek E.A., Lavy V. and K. Hitomi (2006) "Do students care about students quality? Determinants of dropout behavior in developing countries"? *NBER Working paper* No. 12737.
- Hanushek E.A. and E.M. Raymond (2004), "The Effect of School Accountability Systems on the Level and the Distribution of Student Achievement", *Journal of the European Economic Association*, Vol. 3(5), pp. 1134-1155.
- Hanushek E. A., Kain J.F. and S.G. Rivking (1999), "Do higher salaries buy better teachers?", *NBER Working Paper* No. W7082.

- Hanushek E.A. (1993) "The Failure of Input-Based Schooling Policies", *Economic Journal* 113 (485), pp. F64-F98.
- Hanushek E.A. (1978) "Conceptual and empirical issues in the estimation of educational production functions", *Journal of Human Resources*, Vol. 14 (3), pp. 351-388.
- Høj J., Galasso V., Nicoletti G. and T. Dang (2006), "An Empirical Investigation of Political Economy Factors Behind Structural Reforms in OECD countries", in *OECD Economic Studies*, No. 42, 2006/1, pp. 87-136.
- Hoxby C. and A. Leigh (2004), "Pulled Away or Pushed Out? Explaining the Decline of Teacher Aptitude in United States", *American Economic Review*, Vol. 94 No. 2, 236-240.
- INVALSI (2008), "La prova nazionale al termine del primo ciclo. Aspetti operativi e prime valutazioni sugli apprendimenti degli studenti", http://www.invalsi.it/areadati/SNV/07-08/Rapporto_finale.pdf.
- INVALSI (2009), "La valutazione dei dirigenti scolastici", http://www.invalsi.it/download/Rapporto_IParte.pdf
- La scuola in cifre, 2007, Ministero dell'istruzione.
- Lamberti A. (2008), "Le determinanti della spesa pubblica per l'istruzione in Italia: 1996-2005", www.unipv.it/websiep/2008/2008204.ppt.
- Leonardi M. (2007), "Do parents' risk aversion and wealth explain secondary school choice?", *Giornale degli Economisti e Annali di Economia*, Vol. 66, No. 3 pp. 177-206.
- Madama I. and F. Maino (2007), "Governance scolastica e differenziazione regionale della scuola secondaria italiana", Chapter 7 in *Da dove vengono le competenze degli studenti italiani*, Edizioni Il Mulino, Bologna.
- Ministry of Education (2007), *Quaderno Bianco Sulla Scuola*, Ministero della Pubblica Istruzione (part of the Ministry of Education, Universities and Research, www.miur.it) http://www.pubblica.istruzione.it/news/2007/allegati/quaderno_bianco.pdf.
- Montanaro P., (2008), "I divari territoriali nella preparazione degli studenti italiani: evidenze dalle indagini nazionali ed internazionali", *Questioni di Economia e Finanza No. 18*, Banca d'Italia.
- OECD 2004, "Teachers Matter", Paris.
- OECD 2008a, *Education at a glance*, OECD Paris.
- OECD 2008b, *Measuring Improvements in Learning Outcomes: Best Practices to Assess the Value-Added of Schools*, OECD Paris.
- OECD 2008c, *Tertiary Education for the Knowledge Society*, OECD Paris.
- OECD 2008d, *Economic Survey of Norway*, OECD Paris.
- OECD 2008e, *Assessing the Challenges of Policy Implementation in Education*, EDU/EDPC(2008)30.

- OECD 2008f, *How do OECD countries take stock of Progress and Performance in Education systems?*, EDU/EPC(2008)33.
- OECD 2008g, *Jobs for Youth, Netherlands*, OECD Paris.
- OECD 2008h, *Jobs for Youth, United Kingdom*, OECD Paris.
- OECD 2008i, *Jobs for Youth, Spain*, OECD Paris.
- OECD 2008j, *Growing unequally*, OECD Paris.
- OECD 2008k, *Improving School Leadership*, OECD Paris.
- O'Higgins N., D'Amato M., Caroleo F. E. and A. Barone (2007), "Gone for good? Determinants of schools dropout in southern Italy", *Giornale degli Economisti e Annali di Economia*, Vol. 66, pp. 207-246.
- Oreopoulos P. (2007), "Do dropouts drop out too soon? Wealth, health and happiness from compulsory schooling", *Journal of Public Economics*, Vol. 91, pp. 2213-2229.
- Paletta A. (2007), "Prime riflessioni sugli aspetti organizzativi della scuola italiana", *Ricerca INVALSI*, available at: <http://www.invalsi.it/invalsi/download.php?page=Convegno07>.
- Piketty T. and M. Valdenaire (2004), "L'impact de la taille des classes sur la reussite scolaire dans les ecoles, colleges et lycees francais :Estimations a partir du panel primaire 1997 et du panel secondaire 1995", Paris, Ministere de l'education nationale, *Les Dossiers* No. 173.
- PIRLS (2007), "PIRLS 2006 International Report: IEA's Progress in International Reading Literacy Study in Primary Schools in 40 Countries," TIMMS and PIRLS International Study Centre, Lynch School of Education, Boston College.
- PISA 2006a, *Science Competencies for Tomorrow's World*. Vol. 1: Analysis, OECD Paris.
- PISA 2006b, *Science Competencies for Tomorrow's World*. Vol. 2: Data, OECD Paris.
- Pozzoli D., "High School and Labour Market outcomes: Italian Graduates", *Giornale degli Economisti e Annali di Economia*, Vol. 66, No. 3, pp. 247-293.
- Quintini G. and S. Martin (2006), "Starting Well or Losing their Way? The Position of Youth in the Labour Market of OECD countries", *OECD Social, Employment and Migration Working Papers* No. 39.
- Spending Review (2008), *La Revision della Spesa Pubblica, Rapporto 2008*, Commissione Tecnica della Finanza pubblica.
- Sutherland D., Price R., Joumard I. and C. Nicq (2007), "Performance Indicators for Spending Efficiency in Primary and Secondary Education", *OECD Economics Department Working Paper* No. 546.
- TIMMS (2008), "TIMSS 2007 International Science Report: Findings from IEA's Trends in International Mathematics and Science Study at the Fourth and Eighth Grades," TIMMS and PIRLS International Study Centre, Lynch School of Education, Boston College.

- Todd P.I. and Wolpin K. I. (2003), “On the Specification and Estimation of Education Production Function”, *The Economic Journal*, 113, F3-F33.
- Yeh S. S. (2007), “The Cost-Effectiveness of Five Policies for Improving Student Achievement”, *American Journal of Evaluation*, Vol. 28, No. 4, pp. 416-436.
- White Paper on Italian schools (2007), (Quaderno Bianco sulla scuola), Ministero delle Finanze e Ministero della Pubblica Istruzione, http://62.77.63.181/ISN_Istruzionesicilia_it/Upload/c8db0f85-d67b-44ac-9776-baed549c438.pdf.
- Wößmann L. (2003), “Schooling, Resources, Educational Institutions and Student Performance: the International Evidence”, *Oxford Bulletin of Economics and Statistics*, 65, No. 2, pp. 117-170.
- Wößmann L. (2005), “The Effect of Heterogeneity of Central Exams: Evidence from TIMMS, TIMMS-Repeat and PISA”, *Education Economics*, 13, No. 2, pp. 143-169.
- Wößmann L., Lüdemann E., Schütz G. and M.R. West (2007a) “School Accountability, Autonomy, Choice and the Level of Student Achievement: International Evidence from PISA 2003, *OECD Education Working Paper* No. 13.
- Wößmann L., Schütz G. and M.R. West (2007b) “School Accountability, Autonomy, Choice and the Equity of Student Achievement: International Evidence from PISA 2003, *OECD Education Working Paper* No. 14.

Annex 1.A1

The determinants of PISA scores: the cross-country perspective and a study of drivers of disparities across Italian regions²⁵

1. Empirical analysis of educational outcomes: methodological background and findings from the literature

1. The literature on the determinants of educational outcomes has expanded significantly in recent years, placing an increasing focus on the study of international data. A relatively standard approach consists of estimating an educational production function (Hanushek, 1978; Todd and Wolpin, 2003; Wößmann, 2003; Wößmann *et al.* 2007a, PISA 2006), where educational outcomes are measured by test results and inputs include a wide range of potential determinants of pupils' achievements, comprising policy and non-policy variables. This chapter follows this approach closely and in particular Wößmann *et al.* (2007a) and Bratti *et al.* (2007) for the empirical strategy.

2. As in OECD (2008d), a distinction can be drawn between factors under direct educational policy influence and those which do not depend on policy when estimating the impact of various drivers of educational outcomes. Demographic and socio-economic background variables, which are less likely to be affected by school and system-level factors, were selected based on previous empirical findings (see PISA, 2006). Controlling for background variables allows the net effects of school and system-level variables to be examined. The background variables used in this study were:

- At student level: PISA index of economic, social and cultural status (ESCS); gender; language spoken at home; immigrant status.
- At school level: School average PISA index of economic, social and cultural status; school size; school location.
- At system level: country fixed effects.

Following a very similar specification to Wößmann *et al.* (2007a) and PISA 2006, the following main policy variables are tested:

- Educational resources: student per teacher ratio; learning time in science; quality of educational resources.

25. This annex has been made in collaboration with Margherita COMOLA. Corresponding author is: romina.boarini@oecd.org.

- Accountability: schools informing parents about pupils' results (comparatively within the school); schools posting achievement data publicly.
- Autonomy: budgeting autonomy, staffing autonomy and curricular content autonomy.
- Interaction between accountability and autonomy.
- Other school policies variables: ability grouping; selectivity in admissions.

2. Econometric analysis of PISA 2006 scores: cross-country and within-country empirical strategy

3. The analysis is conducted in two stages. In the first stage international best-practices are elicited through a cross-country regression of PISA scores on various policy and non-policy determinants of educational outcomes. In this stage the Italian sample is also looked on its own to assess whether there are significant differences among the main drivers of educational outcomes compared with the OECD area as a whole.

4. Italy shows marked geographical variation in educational achievements; a key question is whether this is related to exogenous factors or to the characteristics of the education system. To start with, a similar conceptual framework to that used in the previous section, is presented. This time the focus of the analysis is Italian regions, and thus the empirical exercise is only carried out on the Italian sample, which allows for this disaggregated level of analysis.²⁶ Following Bratti *et al.*, (2007), the analysis introduces a fixed effect at macro-regional level (north versus centre/south²⁷) to control for possible contextual effects of various types (results not shown in the table). In a second step, this fixed effect is supplemented by explicit proxies for contextual effects at the province level (provinces are a sub-division of regions), such as labour market, criminality rate and number of immigrants, and by variables identifying the school type²⁸. This regression was also estimated separately for the North and the South to assess if there are any differences in drivers of educational outcomes across these two macro-areas.

3. Data sources

5. The initial sample size is 246 562 students for the OECD area and 21 773 students for Italy, however the sample size decreases whenever independent variables with missing observations are included in the analysis. In order to control for environmental and geographical factors correlated with pupils' performance the information contained in PISA 2006 survey is merged with school-level and provincial-level variables from other statistical sources.

6. PISA 2006's student and school questionnaires are the main data sources. For the treatment of missing values and for the definition of individual-level and school-level variables PISA 2006's guidelines have been followed. For further clarification, the reader is referred to Annex A.8 in PISA 2006. Missing

26. Italy is one of the few OECD countries which stratifies PISA sample at regional level. Other countries include Belgium, the United Kingdom and Spain. However, since the geographical divide in these countries is structurally very different from the Italian one, the analysis has focused on the Italian regions only.

27. The Centre has been analyzed together with the South due to the exiguous number of observations (3.7% of the overall Italian sample).

28. In order to ensure school-type comparability, in the last three column of Table 1.A1.1 (as well as in all other specification including the type of school) the pupils still attending lower secondary school (less than 1% of observations) have been excluded from the sample.

data (under 5% for most variables) has been treated by imputing plausible values. In the OECD sample, France is excluded due to the unavailability of the school-level information.

7. School-level data on teachers' characteristics and mobility come from the Ministry of Education and the National Institute for the Evaluation of the Educational System (INVALSI). These data only cover schools under the direct authority of the Ministry of Education, and therefore do not provide information on vocational schools under the jurisdiction of local governments, on experimental curricula, and on school located in the autonomous provinces of Trento and Bolzano. The three indexes of teachers' turnover, preference for mobility towards the school and away from the school refer to year 2006, while school level data on teachers' gender and tenure status refer to year 2007-2008. No missing data imputation was used.

8. Provincial level controls come from the National Statistical Institute (ISTAT). The percentage of immigrant residents refers to year 2006, while criminality rate, employment and unemployment rate refer to year 2005. No missing data imputation was used. Additional information on variable definitions and descriptive statistics is reported in Table 1.A1.1.

Table 1.A1.1. Descriptive statistics of the variables used in the empirical model

Variable	OECD (n=246562)		Italy (n=21597)		Italy: north (n=13320)		Italy: centre-south (n=8277)	
	mean	sd	mean	sd	mean	sd	mean	sd
Pv1scie	496.79	99.65	488.19	95.42	511.20	93.16	451.15	86.99
Family socio-economic background	-0.05	1.03	-0.07	0.95	-0.01	0.93	-0.18	0.99
Family socio-economic background (square)	1.05	1.52	0.92	1.16	0.86	1.13	1.00	1.21
Female ^(D)	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Native ^(D)	0.90	0.30	0.94	0.24	0.93	0.26	0.96	0.20
Speak national languages at home ^(D)	0.92	0.27	0.85	0.36	0.85	0.35	0.84	0.37
School located in rural area ^{(D) (1)}	0.33	0.47	0.25	0.43	0.24	0.42	0.28	0.45
School located in a city ^{(D) (1)}	0.34	0.47	0.25	0.43	0.28	0.45	0.20	0.40
School size	7.64	5.46	6.69	4.12	6.14	4.07	7.56	4.04
School size (square)	88.19	199.46	61.66	75.14	54.29	72.26	73.52	78.11
Family socio-economic background, school level	-0.05	0.65	-0.07	0.51	-0.01	0.50	-0.18	0.50
School with ability grouping for all subjects ^(D)	0.15	0.36	0.20	0.40	0.15	0.35	0.27	0.45
School with low academic selectivity ^{(D) (2)}	0.40	0.49	0.47	0.50	0.45	0.50	0.50	0.50
School with high academic selectivity ^{(D) (3)}	0.17	0.37	0.05	0.22	0.04	0.19	0.06	0.25
Student-teacher ratio	14.85	7.66	8.78	2.59	8.57	2.54	9.12	2.63
Index of quality of school educational resources	-0.02	1.04	0.22	0.97	0.35	0.93	0.01	0.99
School average learning time in science	10.84	2.13	10.97	2.15	10.97	2.31	10.99	1.87
School informing parents on children's performance relative to other students in the school ^(D)	0.54	0.50	0.18	0.39	0.17	0.38	0.20	0.40
School posting achievement data publicly ^(D)	0.36	0.48	0.32	0.47	0.38	0.48	0.24	0.42
School autonomy in staff decisions	-0.12	1.01	-0.89	0.61	-0.82	0.70	-1.01	0.39
School autonomy in budget decisions	0.13	0.90	-0.43	0.71	-0.46	0.73	-0.39	0.66
School autonomy in educational content decision	0.03	0.92	0.37	0.65	0.28	0.63	0.50	0.66
Vocational schools (teaching, art) ^{(D) (4)}			0.09	0.29	0.08	0.27	0.12	0.32
Vocation schools (technical) ^{(D) (5)}			0.32	0.47	0.32	0.47	0.33	0.47
Professional schools ^{(D) (6)}			0.17	0.37	0.15	0.36	0.19	0.40
Other schools ^{(D) (7)}			0.09	0.29	0.14	0.35	0.00	0.07
Percentage of immigrant residents, province level			4.29	2.43	5.89	1.31	1.71	1.38
Criminality rate, province level ⁽⁸⁾			4.20	1.79	4.50	1.92	3.71	1.42
Employment rate, province level			58.66	9.27	65.18	2.74	48.13	5.74
Unemployment rate, province level			7.61	4.96	4.10	1.06	13.28	3.23
Teachers turnover, school level ⁽⁹⁾			0.43	0.21	0.43	0.21	0.43	0.22
Teachers want to move to that school, school level ⁽¹⁰⁾			0.02	0.04	0.02	0.04	0.02	0.04
Teachers exiting from the school, school level ⁽¹¹⁾			-0.14	0.12	-0.12	0.12	-0.15	0.13
Tenured teachers, school level ⁽¹²⁾			80.76	3.43	79.27	2.91	82.46	3.17
Women teachers, school level ⁽¹²⁾			61.07	3.55	62.13	3.70	59.86	2.94

Notes: (D) dummy variables.

(1) Omitted category: school located in a town (between 15 000 and 100 000 inhabitants).

(2) Schools where students' past academic records and recommendation of feeder schools are not taken into account for admission.

(3) Schools where students' past academic records and recommendation of feeder schools are a prerequisite for administration.

(4) *istituto d'arte, scuola magistrale* (omitted category: *liceo artistico, liceo classic, liseo scientifico*)

(5) *istituto tecnico* (omitted category: *liceo artistico, liceo classic, liseo scientifico*)

(6) *istituto professionale* (omitted category: *liceo artistico, liceo classic, liseo scientifico*)

(7) Other upper secondary curricula (omitted category: *liceo artistico, liceo classic, liseo scientifico*)

(8) Number of criminal offenses over 100 inhabitants.

(9) Total number of teachers moving in or out the school over average teachers' number in two adjacent years.

(10) Number of teachers who want to move in the school minus number of teachers who want to move out.

(11) Share of tenured teachers filling requests to move elsewhere.

(12) Expressed as a share of overall school teachers.

4. Main results from cross-country regressions

9. In line with previous studies, family background significantly affects educational outcomes. This happens directly, *i.e.* at pupil level, but also indirectly through peer effects occurring when there is social segregation at school level (Table 1.A1.2). The effect of family background is also seen in the impact of ethnic origin (country of birth and language spoken at home). These findings broadly apply to both Italy and the OECD as a whole, a significant difference being the relative importance of the direct and indirect effect of family background, Italy being particularly characterized by social segregation at school level. Location in big cities is systematically associated with worse school results in the OECD as a whole, but in Italy poorer scores are observed in rural schools.

10. Big schools perform better in the OECD area but not in Italy. However, in Italy a higher student per teacher ratio is associated with better outcomes. The impact of instruction time in science on PISA scores is strongly positive, both in the cross-country sample and the Italian one. As far as the OECD area as a whole is concerned, the quality of educational resources (proxied by the existence and the adequacy of teaching material, computers, library and other facilities) is associated with higher PISA scores, but no similar effect is observed for Italy.

11. School governance policies matter for pupils' results, though less than individual and other school level factors (as shown in Figure 8). Pupils in highly selective schools record better outcomes, possibly because the pupils are more able, or because such schools attract the best teachers, or a combination of both. Admission policies do not matter for Italy, which may reflect a lack of variance in this respect (*i.e.* there are too few schools practicing selection at entry) but also the ineffectiveness of selective schools in producing better outcomes.

12. In the OECD area accountability policies (as self-reported by schools) affect educational outcomes, as shown by the fact that schools posting results of national assessment test/final exam publicly and those who inform parents about pupils' relative results within the school, are schools where pupils obtain higher PISA scores. In Italy only the former type of accountability has a positive impact on pupils' results, and to a much greater extent than in the OECD area as a whole, especially when accountability goes together with autonomy in staff management.²⁹

13. The role of autonomy is found to be more ambiguous. For the OECD as a whole, schools which can freely manage their staff tend to do worse, while those who are autonomous in budget allocation do slightly better. In Italy, autonomy in staff management is also associated with lower pupils' results, unless the school publishes results publicly. This can be related to two facts: first, that staff management autonomy in public schools is limited to non-tenured teachers (and non-tenured teachers are not recruited through a strict selection process, as discussed in the chapter); second, full autonomy in hiring and firing decisions in Italy is limited to private schools, nearly all of which have poor results. The effects of other forms of autonomy are either negative or not significantly different from zero. In further estimates (not reported here but to be available in a working paper) the interaction of autonomy and accountability was investigated. The results are in line with the baseline shown in Table 1.A1.1. and in addition indicate that accountability and autonomy policies are complementary: both are needed to avoid that an uncontrolled use of autonomy leads to bad school results.

29. In Italy general education schools mainly do that, while VET schools tend to be less accountable.

Table 1.A1.2. The determinants of educational achievements, cross-country and within country analysis

	Stage 1		Stage 2		
	OECD area	Italy	Italy	North	Centre and South
Family socio-economic background	20.079 [0.000]***	6.39 [0.001]***	5.889 [0.000]***	6.030 [0.000]***	5.686 [0.000]***
Family socio-economic background (square)	4.171 [0.000]***	-2.589 [0.184]	-1.411 [0.035]**	-1.786 [0.034]**	-1.342 [0.113]
Female	-4.815 [0.000]***	-10.487 [0.001]***	-13.059 [0.000]***	-11.122 [0.000]***	-13.914 [0.000]***
Native	21.629 [0.000]***	29.743 [0.007]***	32.633 [0.000]***	43.069 [0.000]***	21.404 [0.001]***
Speak national language at home	25.599 [0.000]***	33.367 [0.000]***	27.097 [0.000]***	26.497 [0.000]***	26.713 [0.000]***
School located in a rural area	3.768 [0.000]***	-13.814 [0.010]**	-6.717 [0.074]*	11.098 [0.020]**	-13.784 [0.005]***
School located in a city	-9.44 [0.000]***	-2.736 [0.594]	-3.539 [0.334]	-3.055 [0.528]	2.878 [0.555]
School size	0.686 [0.000]***	-0.567 [0.700]	2.817 [0.034]**	3.612 [0.006]***	2.416 [0.195]
School size (square)	-0.002 [0.464]	-0.002 [0.975]	-0.090 [0.181]	-0.114 [0.060]*	-0.089 [0.333]
Family socio-economic background, school level	41.444 [0.000]***	60.044 [0.000]***	13.626 [0.011]**	27.863 [0.000]***	6.110 [0.417]
School with ability grouping for all subjects	-0.443 [0.742]	-5.335 [0.180]	3.848 [0.279]	2.626 [0.618]	5.767 [0.217]
School with low academic selectivity	1.034 [0.339]	-2.194 [0.469]	6.629 [0.020]**	2.706 [0.406]	7.792 [0.031]**
School with high academic selectivity	15.705 [0.000]***	2.295 [0.776]	12.574 [0.126]	17.630 [0.013]**	9.575 [0.309]
Student-teacher ratio	0.115 [0.242]	3.158 [0.000]***	1.566 [0.094]*	1.338 [0.235]	2.157 [0.085]*
Index of quality of school educational resources	1.112 [0.009]***	1.903 [0.177]	1.218 [0.508]	2.344 [0.279]	0.685 [0.755]
School average learning time in science	9.572 [0.000]***	8.778 [0.000]***	6.079 [0.000]***	6.709 [0.000]***	5.493 [0.000]***
School informing parents on childrens' performance relative to other students in the school	1.904 [0.024]**	-5.332 [0.594]	-2.116 [0.863]	-6.412 [0.653]	-10.514 [0.436]
School posting achievement data publicly	5.173 [0.000]***	25.757 [0.000]***	6.518 [0.476]	7.840 [0.421]	1.878 [0.935]
School autonomy in staff decisions	-3.864 [0.001]***	-9.945 [0.002]***	-9.072 [0.020]**	-12.208 [0.001]***	-2.168 [0.783]
School informing parents and being autonomous in staff decision	-0.586 [0.638]	1.544 [0.845]	-1.625 [0.883]	-19.825 [0.162]	-2.603 [0.832]
School posting achievement data and being autonomous in staff decision	1.395 [0.174]	19.751 [0.000]***	13.152 [0.094]*	12.080 [0.164]	18.613 [0.392]

	Stage 1		Stage 2		
	OECD area	Italy	Italy	North	Centre and South
School autonomy in budget decisions	1.744 [0.012]**	0.81 [0.742]	-1.136 [0.660]	-1.744 [0.693]	2.211 [0.469]
School informing parents and being autonomous in budget decision	-2.281 [0.009]***	-7.92 [0.277]	-3.102 [0.674]	9.089 [0.419]	-7.630 [0.399]
School posting achievement data and being autonomous in budget decision	0.471 [0.597]	-16.963 [0.001]***	-8.747 [0.055]*	-8.028 [0.246]	-12.495 [0.106]
School autonomy in educational content decision	0.231 [0.810]	-3.621 [0.305]	-0.714 [0.801]	-1.655 [0.705]	-2.458 [0.499]
School informing parents and being autonomous in educational content decision	-1.063 [0.302]	-6.564 [0.274]	-4.358 [0.383]	1.427 [0.870]	0.347 [0.959]
School posting achievement data and being autonomous in educational content decision	0.429 [0.716]	-8.837 [0.062]*	3.037 [0.597]	5.022 [0.391]	8.331 [0.423]
Percentage of immigrant residents, province level			1.220 [0.348]	-0.211 [0.874]	2.947 [0.161]
Criminality rate, province level			-1.531 [0.030]**	-3.715 [0.000]***	-1.735 [0.139]
Employment rate, province level			-0.048 [0.953]	-4.480 [0.000]***	0.973 [0.387]
Unemployment rate, province level			-4.384 [0.005]***	-15.199 [0.000]***	-2.182 [0.243]
Vocational schools (teaching, art)			-37.635 [0.000]***	-32.387 [0.000]***	-42.026 [0.000]***
Vocation schools (technical)			-44.037 [0.000]***	-37.136 [0.000]***	-49.050 [0.000]***
Professional schools			-74.696 [0.000]***	-64.161 [0.000]***	-78.561 [0.000]***
Other schools			-65.099 [0.000]***	-46.212 [0.000]***	-70.034 [0.002]***
South			-18.292 [0.007]***		
Country-level fix effects	yes	-	-	-	-
Constant	273.395 [0.000]***	305.576 [0.000]***	415.611 [0.000]***	737.569 [0.000]***	344.075 [0.000]***
Observations	246562	21773	21567	13320	8247
R-squared	0.352	0.345	0.421	0.398	0.378

BRR t-statistics in brackets * significant at 10%; ** significant at 5%; *** significant at 1%

5. Main results from within country regression

14. The diversity of upper-secondary education programmes across OECD countries makes it inappropriate to study the impact of the type of school with a cross-country approach. However, in the Italian national sample the impact of VET schools compared with general education programmes can be assessed. As shown in Table 1.A1.2 (Stage 2 columns), pupils attending VET schools (of various orientation) perform significantly worse than those in general education (“licei” in Italy, the reference variable in the specification). The effect is large: the difference in scores between professional and general schools is 75 points, *i.e.* almost the equivalent of two years of schooling; the difference between teaching or art schools (*licei magistrali* or *licei artistici*) and general programmes is just over half of this. The type of school is by far the biggest determinant of PISA scores in this specification: its impact ranges between the equivalent of that of family background to its double. Endogeneity is a serious problem, however; VET schools may be more likely to attract weak students, as they have the reputation of being easier (Bratti *et al.*, 2007). This endogeneity problem cannot be dealt with directly in the absence of suitable instruments in the PISA dataset, so these large estimated impacts may not be the genuine effect of lower quality education in VET schools.

15. As expected, another important driver of PISA results is the region in which schools are located. As the main text pointed out, much of this variation is accounted for by contextual variables, but even when they are included, regional fixed effects are still significant in the within-country regression carried out on the Italian sample (Table 1.A1.2, third column). Contextual factors may be related to the social, cultural and economic school environment or to schools themselves. The former set of factors is proxied by contextual variables as in Bratti *et al.* (2007). The second set is captured by PISA accountability and autonomy indicators. In a robustness analysis, other variables indirectly proxying school-level teachers characteristics and preferences are tested (Table 1.A1.3; further analysis is available in the forthcoming working paper).

16. This specification is also conducted separately on two macro-areas (the North and the Centre-South) to gather more insights on the possibly different contribution of contextual and school drivers of performance to pupils’ results. In line with previous studies (Bratti *et al.*, 2007) contextual effects are found to explain part of the variation in educational outcomes: higher unemployment is associated with lower PISA scores, as is a higher criminality rate.

17. The analysis by macro-area finds that the drivers of educational outcomes are generally quite homogenous across regions. Exceptions to this include the advantage of being native, which is higher in the North, and the disadvantage of attending a school located in a rural area, which is higher in the South. The first factor may reflect a more difficult integration of immigrants in Northern regions (where they are also much more numerous) while the second finding may indicate that the cultural backwardness of some rural areas in southern regions act as an impediment to pupils’ learning.

18. In a further exception the role of school average background and school type are not of the same size across regions. Peer effects are stronger in the North, but virtually nil in the Centre-South. By contrast, attending a VET school has a much stronger negative effect in the South than in the North. To the extent these two variables (school type and school average socio-economic background) are correlated, it is likely that social segregation at school level does occur in both parts of the country, but in different ways (in the North it may be due to the school reputation through peer effects, in the South to the type of school).

Table 1.A1.3. Robustness analysis of within country regression

	Controlling for school average socio-economic background, teachers mobility and type of school	Controlling for school average socio-economic background	Controlling for teachers mobility	Controlling for type of school	Controlling for school average socio-economic background and teachers mobility	Controlling for school average socio-economic background and type of school	Controlling for teachers mobility and type of school
Family socio-economic background	5.635*** [0.000]	6.079*** [0.000]	11.61*** [0.000]	7.251*** [0.000]	5.692*** [0.000]	5.948*** [0.000]	6.359*** [0.000]
Family socio-economic background (square)	-1.620** [0.014]	-1.427** [0.031]	-1.760*** [0.008]	-1.400** [0.038]	-1.682*** [0.007]	-1.399** [0.035]	-1.632** [0.016]
Female	-14.59*** [0.000]	-10.22*** [0.000]	-11.36*** [0.000]	-13.12*** [0.000]	-12.91*** [0.000]	-12.96*** [0.000]	-14.64*** [0.000]
Native	30.36*** [0.000]	33.59*** [0.000]	31.97*** [0.000]	31.88*** [0.000]	32.29*** [0.000]	32.05*** [0.000]	30.13*** [0.000]
Speak national language at home	26.86*** [0.000]	28.48*** [0.000]	31.35*** [0.000]	26.79*** [0.000]	28.58*** [0.000]	26.43*** [0.000]	27.04*** [0.000]
School located in a rural area	-8.185* [0.073]	-9.582* [0.068]	-5.635 [0.300]	-9.146** [0.019]	-8.144 [0.133]	-8.517** [0.029]	-7.951* [0.080]
School located in a city	0.00666 [0.999]	-8.339** [0.045]	-3.425 [0.474]	0.144 [0.970]	-6.949 [0.125]	-1.965 [0.605]	1.152 [0.780]
School size	2.326* [0.088]	2.181 [0.165]	0.0672 [0.967]	3.016** [0.024]	1.283 [0.427]	3.110** [0.021]	2.251* [0.098]
School size (square)	-0.0698 [0.298]	-0.0772 [0.271]	0.0114 [0.875]	-0.101 [0.128]	-0.0325 [0.647]	-0.103 [0.118]	-0.0673 [0.318]
Family socio-economic background, school level	9.716 [0.101]	50.55*** [0.000]			47.10*** [0.000]	13.79** [0.011]	
School with ability grouping for all subjects	5.008 [0.136]	1.697 [0.675]	6.102 [0.134]	3.041 [0.400]	4.886 [0.198]	2.942 [0.415]	5.133 [0.129]
School with low academic selectivity	4.640 [0.123]	6.261* [0.093]	7.240* [0.071]	6.519** [0.027]	5.278 [0.144]	6.162** [0.035]	4.852 [0.115]
School with high academic selectivity	10.10 [0.196]	6.614 [0.489]	8.687 [0.239]	10.46 [0.157]	8.434 [0.392]	10.30 [0.197]	10.25 [0.159]

	Controlling for school average socio-economic background, teachers mobility and type of school	Controlling for school average socio-economic background	Controlling for teachers mobility	Controlling for type of school	Controlling for school average socio-economic background and teachers mobility	Controlling for school average socio-economic background and type of school	Controlling for teachers mobility and type of school
Student-teacher ratio	1.819* [0.069]	4.134*** [0.000]	7.520*** [0.000]	1.885* [0.052]	4.161*** [0.000]	1.576* [0.098]	1.983* [0.051]
Index of quality of school educational resources	-0.00217 [0.999]	-0.569 [0.789]	-1.177 [0.571]	1.236 [0.524]	-1.317 [0.520]	0.864 [0.655]	0.190 [0.918]
School average learning time in science	6.126*** [0.000]	8.176*** [0.000]	9.779*** [0.000]	5.924*** [0.000]	8.296*** [0.000]	5.831*** [0.000]	6.173*** [0.000]
School informing parents on childrens' performance relative to other students in the school	19.91 [0.171]	-2.602 [0.852]	7.365 [0.704]	-2.595 [0.834]	19.31 [0.302]	-2.856 [0.821]	18.64 [0.197]
School posting achievement data publicly	3.523 [0.752]	3.927 [0.742]	-9.202 [0.538]	8.243 [0.415]	-7.981 [0.572]	7.002 [0.487]	4.698 [0.674]
School autonomy in staff decisions	-5.909 [0.263]	-10.90** [0.029]	0.726 [0.910]	-9.080** [0.022]	-2.649 [0.648]	-9.378** [0.020]	-5.940 [0.261]
School informing parents and being autonomous in staff decision	19.18 [0.128]	-1.841 [0.882]	7.915 [0.627]	-2.125 [0.852]	18.08 [0.262]	-2.667 [0.816]	18.26 [0.141]
School posting achievement data and being autonomous in staff decision	7.710 [0.443]	8.556 [0.386]	-6.043 [0.660]	12.93 [0.146]	-2.681 [0.832]	12.18 [0.162]	8.518 [0.399]
School autonomy in budget decisions	-0.935 [0.714]	-0.723 [0.810]	-0.860 [0.810]	-1.221 [0.657]	0.707 [0.799]	-1.199 [0.649]	-1.280 [0.628]
School informing parents and being autonomous in budget decision	-10.11 [0.172]	-4.767 [0.516]	-17.10* [0.071]	-4.724 [0.529]	-12.40 [0.109]	-4.101 [0.576]	-10.52 [0.168]
School posting achievement data and being autonomous in budget decision	-7.909* [0.089]	-8.291* [0.089]	-6.260 [0.289]	-7.684* [0.094]	-9.349* [0.067]	-8.005* [0.075]	-7.389 [0.115]
School autonomy in educational content decision	-0.945 [0.745]	-0.290 [0.926]	3.570 [0.293]	0.240 [0.937]	0.00990 [0.997]	-0.378 [0.898]	-0.612 [0.836]

	Controlling for school average socio-economic background, teachers mobility and type of school	Controlling for school average socio-economic background	Controlling for teachers mobility	Controlling for type of school	Controlling for school average socio-economic background and teachers mobility	Controlling for school average socio-economic background and type of school	Controlling for teachers mobility and type of school
School informing parents and being autonomous in educational content decision	-3.922 [0.458]	-2.724 [0.676]	-7.780 [0.206]	-4.967 [0.325]	-4.535 [0.472]	-5.130 [0.317]	-4.061 [0.452]
School posting achievement data and being autonomous in educational content decision	-1.393 [0.751]	-1.614 [0.802]	-8.344 [0.224]	1.832 [0.749]	-5.165 [0.360]	1.863 [0.743]	-1.458 [0.744]
Teachers turnover, school level	5.208 [0.711]		-8.647 [0.434]		7.525 [0.519]		2.679 [0.847]
Teachers want to move to that school, school level	122.1** [0.045]		362.5*** [0.000]		196.4** [0.013]		136.4** [0.026]
Teachers exiting from the school, school level	-3.657 [0.890]		-30.86 [0.450]		-19.31 [0.590]		-3.592 [0.891]
Vocational schools (teaching, art)	-39.58*** [0.000]			-43.39*** [0.000]		-37.69*** [0.000]	-43.60*** [0.000]
Vocation schools (technical)	-44.89*** [0.000]			-52.07*** [0.000]		-44.64*** [0.000]	-49.98*** [0.000]
Professional schools	-74.01*** [0.000]			-87.17*** [0.000]		-76.28*** [0.000]	-81.18*** [0.000]
Other schools	0 [.]			-79.57*** [0.000]		-68.49*** [0.000]	0 [.]
South	-17.48** [0.014]	-17.07** [0.047]	-19.49*** [0.008]	-13.74** [0.038]	-21.34** [0.014]	-15.05** [0.032]	-16.95** [0.012]
Constant	453.0*** [0.000]	322.3*** [0.000]	142.2 [0.108]	492.4*** [0.000]	282.7*** [0.002]	493.1*** [0.000]	451.7*** [0.000]
Observations	16028	17586	16028	17586	16028	17586	16028
R-squared	0.418	0.397	0.374	0.421	0.396	0.423	0.418

* significant at 10%; ** significant at 5%; *** significant at 1%

19. Finally, there seems to be very little difference in the impact of school governance across the country, as also illustrated by Figure 9. In fact when splitting the sample into the two macro-areas, school governance policies seem to matter very little, if not at all for educational outcomes. This could be either due to insufficient variation in school governance within each region when controlling for other variables correlated with governance (for instance the type of upper-secondary school), but also to the fact that accountability and autonomy are implemented in ways that are ineffective for pupils' results.

20. Some robustness analysis was carried out around the baseline specification to see whether other school characteristics may explain the different performance of pupils in the North and in the South. In the absence of any direct measure of teaching quality, three variables measuring teachers' working environment and the willingness of teachers to change schools are considered. These indicators (based on Barbieri *et al.*, 2007), described in the main chapter, are teachers' turnover, teachers' revealed preference to be in a given school and the teachers' exit rate at school level. Only the revealed preference indicator is significantly and strongly associated to higher PISA scores (the elasticity is around 5%, almost as much that of the family background at individual level). However, one cannot distinguish the hypothesis that this is because more motivated teachers (*i.e.* those who work in the most requested schools) get better results from the hypothesis that teachers strive to go to the schools with the better pupils.

21. Some evidence in favour of the former explanation is shed by comparing regressions where these three indicators are tested with and without two other variables that may capture for school reputation effect (see Table 1.A1.3). When school average socio-economic background and type of upper-secondary school are not controlled for, the impact of the revealed preferences indicator is three times larger (third column of Table 1.A1.3). When school average socio-economic background is also included, the effect of revealed preferences indicator decreases quite significantly (see second last column of Table 1.A1.3). The school type is correlated with both the revealed preference indicator and the school average socio-economic background, nevertheless coefficients for this variable are largely unchanged across all specifications; there is a robust negative impact from attending those schools irrespective of the average social background of vocational schools and the quality of their teaching environment.

22. To summarise, this robustness exercise shows that some of the reasons why teachers want to move to (or way from) a given school have to do with peer effects and school type. It is thus important to control for the three sets of regressors at the same time, to assess the importance of teachers' willingness to move across schools on pupils' results. Endogeneity bias arising from the use of the revealed preference indicator may still remain if school reputation is linked to pupils' ability besides their social origin and the type of school chosen. This could be the case, for instance, if schools made systematic use of admission policies based on ability or on previous pupil's results. However, as noticed earlier, this is rare in Italy.

6. Discussion and caveats

23. This empirical exercise has looked at the impact of various determinants of PISA scores, both with a comparative perspective across OECD countries and within Italy. The main findings are that individual level factors, such as a pupil's family background and ethnic origin, matter the most for explaining PISA scores. School governance policies, such accountability and autonomy, are also important though to a lower extent. This is true for both the cross-country and the within-country analysis. The latter has also found that drivers of PISA scores are not very different across regions, even though pupils in the South perform significantly worse than pupils in the North. Unfavourable contextual effects in the South may explain part of the disparity in learning outcomes, while school level factors do not seem to matter. A caveat has to be made in that respect: variables used to control school contribution to pupils' results may not be satisfactory, suffering from measurement error or not being relevant for the Italian context. Some further insight has been obtained by using data on teachers' mobility across schools as an indicator of teacher quality. Results show that schools with a better teaching environment are associated with higher

PISA scores, this holds true when controlling for other school factors that may capture pupils' ability through school reputation effects through, thus suggesting that the quality of teaching environment matters over and above pupils' skills.

24. Some caveats have to be borne in mind when interpreting the findings from this empirical analysis. First, the cross-sectional nature of PISA data allows one to study the impact of educational policies on pupils' results only under some assumptions that might not be met in practice (see OECD 2008d). Thus policy variable effects do not necessarily indicate causality, but many correlations are clear and causality often plausible. Second, this methodological approach relies on parametric assumptions on which there are few priors. Third, PISA dataset suffers from some limitations, notably the lack of information on learning inputs before age 15; a limited coverage of schools in each country; measurement errors arising from using survey data and, in particular, from using subjective answers from schools to capture national policy settings. Finally, it is worth noticing that the problem of socio-economic stratification by type of school is particularly severe in the Italian case, and no light can be shed of the causal nature of the issue with the data at hand.

25. This analysis has only looked at the influence of drivers of average learning outcomes and not of equity of achievements. However, Wößmann *et al.* (2007b) as well as the initial international report for PISA 2006 (OECD, 2007) find that most of educational policies which matter for average performance (namely school accountability and autonomy) do not have a detrimental impact on equity of achievements.

WORKING PAPERS

The full series of Economics Department Working Papers can be consulted at www.oecd.org/eco/working_papers/

726. *Iceland: Challenging Times for Monetary and Fiscal Policies*
(August 2009) Andrea De Michelis
725. *Iceland: The Financial and Economic Crisis*
(August 2009) David Carey
724. *The role of transparency in the conduct of monetary policy*
(September 2009) Makoto Minegishi and Brosi Cournède
723. *Raising education outcomes in Greece*
(September 2009) Vassiliki Koutsogeorgopoulou
722. *Improving the performance of the public health care system in Greece*
(September 2009) Charalampos Economou and Claude Giorno
721. *Is there a case for price-level targeting?*
(August 2009) Boris Cournède and Diego Moccero
720. *The challenge of restoring French competitiveness*
(August 2009) Rafal Kierzenkowski
719. *Improving the functioning of the Slovenian labour market*
(August 2009) Isabell Koske
718. *What drives sovereign risk premiums? An analysis of recent evidence from the Euro Area*
(July 2009) David Haugh, Patrice Ollivaud, and David Turner
717. *The English National Health Service: an economic health check*
(July 2009) Peter Smith and Maria Goddard
716. *Financial stability in the United Kingdom: Banking on prudence*
(July 2009) Philip Davis
715. *Economic growth and the role of taxation- disaggregate data*
(July 2009) Gareth D. Myles
714. *Economic growth and the role of taxation – Aggregate data*
(July 2009) Gareth D. Myles
713. *Economic growth and the role of taxation – Theory*
(July 2009) Gareth D. Myles
712. *The effectiveness of education and health spending among Brazilian municipalities*
(July 2009) Luiz de Mello and Mauro Pisu

711. *The bank lending channel of monetary transmission in Brazil: A VECM approach*
(July 2009) Luiz de Mello and Mauro Pisu
710. *How does decentralised minimum-wage setting affect unemployment and informality? The case of Indonesia*
(July 2009) Margherita Comola and Luiz de Mello
709. *Intergenerational social mobility in European OECD countries*
(July 2009) Orsetta Causa, Sophie Dantan and Åsa Johansson
708. *Equity in student achievement across OECD countries: an investigation of the role of policies*
(July 2009) Orsetta Causa and Catherine Chapuis
707. *Intergenerational social mobility*
(July 2009) Orsetta Causa and Åsa Johansson
706. *Taxes or grants: what revenue source for sub-central governments?*
(July 2009) Hansjörg Blöchliger and Oliver Petzold
705. *The spending power of sub-central governments: a pilot study*
(July 2009) Steffen Bach, Hansjörg Blöchliger and Dominik Wallau
704. *Price and volume elasticities of Brazilian foreign trade: A profit function approach*
(July 2009) Luiz de Mello and Mauro Pisu
703. *Current account sustainability in Brazil: A non linear approach*
(July 2009) Luiz de Mello and Matteo Mogliani
702. *The incentives to participate in and the stability of international climate coalitions: a game-theoretic approach using the WITCH Model*
(July 2009) Valentina Bosetti, Carlo Carraro, Enrica De Cian, Romain Duval, Emanuele Massetti and Massimo Tavoni
701. *The economics of climate change mitigation: how to build the necessary global action in a cost-effective manner*
(June 2009) Jean-Marc Burniaux, Jean Chateau, Rob Dellink, Romain Duval and Stéphanie Jamet
700. *Capital inflows, household debt and the boom bust cycle in Estonia*
(June 2009) Zuzana Brixiova, Laura Vartia and Andreas Wörgötter
699. *The effect of financial crises on potential output: new empirical evidence from OECD countries*
(May 2009) Davide Furceri and Annabelle Mourougane
698. *Employment - productivity trade-off and labour composition*
(May 2009) Hervé Boulhol and Laure Turner
697. *Labour market flexibility in Estonia: what more can be done?*
(May 2009) Zuzana Brixiova
696. *Structural policies to overcome geographic barriers and create prosperity in New Zealand*
(April 2009) Yvan Guillemette