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by Gianna Barbieri, Piero Cipollone and Paolo Sestito

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"la bontà di una istituzione, in ultima analisi, dipende sempre dalla qualità dei suoi membri e dei suoi capi, ma non vi è dubbio che rigidi ordinamenti istituzionali possono frustrare e obliterare generosi dosi di buona volontà e di energie umane"

Carlo Maria Cipolla
Literacy and Development in the West

LABOUR MARKET FOR TEACHERS: DEMOGRAPHIC CHARACTERISTICS AND ALLOCATIVE MECHANISMS

By Gianna Barbieri∗, Piero Cipollone and Paolo Sestito♣

Abstract

The paper considers the teachers' labour market in Italy. The quality and motivation of teachers are certainly among the determinants of pupils' achievement, but they are difficult to measure, so we examine the composition of the pool of teachers and their behaviour to infer information about them. We look also at the institutional features that motivate the implicit contract that drives Italian teachers' behaviour, which essentially involves low salary and correspondingly low commitment and effort. In particular we examine the mechanism that allocates teachers to schools. For each school we construct three indicators; one indicating the level of turnover, which we interpret as a source of turmoil; one that refers to the mismatch between tenured teachers and their school; and a "revealed preferences indicator" that measures the schools' quality as evaluated by the population of tenured teachers. We measure the association at the school level of our indicators with achievement as gauged by PISA 2003. Students scores are correlated negatively to the turnover and the mismatch indicators, positively to revealed preferences.

JEL Classification: I20, I21, I28

Keyvords: teachers labour market, Italian educational system

Contents

∗ Ministry of Education.
♣ Bank of Italy, Department for Structural Economic Analysis.

1 Introduction and main results[1]

This paper examines teachers' labour market in Italy. We look at the composition of their pool, to their behaviour and to the mechanisms that allocate them to schools. The motivation for this endeavour is the search for credible explanations for the disappointing performance of the Italian schooling system, as evidenced in PISA and, to a more limited extent, in other comparable international surveys of students achievement such as PIRLS and TIMSS. We believe that the administrative rules governing this market are such to divert teachers' incentives from pursuing the best performance of their students. This thrust has been stimulated by the reading of the growing body of literature that is convincingly demonstrating that teachers matters (OECD 2004). The link between teachers' market functioning and teachers effectiveness is not easy to establish because the dearth of reliable information about teachers' quality, motivation and exerted effort. The idea of this paper is to overcome this lack of information and to look at the correlation between students' achievements and some features of the teachers' labour market. On the link between these features and the motivation and quality of teachers this paper is more speculative.

The contribution of the paper is mostly descriptive. Firstly we use LFS data in order to compare teachers' socio-economic characteristics and labour market behaviour to those of other Italian workers, providing indirect support to the claim that Italian teachers are very much under stress (OECD 2004) and suffer from the lack of incentives and motivation. Then we use administrative data in order to construct three indicators for each individual school: one indicating the level of *turnover*, one the quality of the match between tenured teachers and their school (a *mismatch* indicator) and the third measuring the quality of the school as evaluated by the whole population of tenured teachers (*revealed preferences* indicator). In our interpretation, turnover is a source of turmoil with potentially negative implications for the effectiveness of teaching activity, particularly in the Italian context where schools and their principals have little voice on the concrete teaching activity that is under strict and unquestionable control of the single teacher. The actual turnover that we measure is quite large and it is not uniquely accounted for by the presence of teachers hired under temporary contract, peregrinating from one school to another every single year. To a sizable extent it is due to tenured teachers, fully covered against the risk of loosing their job position, who ask and obtain to move to other schools in force of a seniority based system. Actually our second indicator, the mismatch indicator that measures the total number of mobility

applications, shows that every year one out of six tenured teachers express the desire to leave the school where currently engaged. In our interpretation this suggests that many teachers are very poorly motivated to exert any effort in their current position; at the end of the day it is their seniority, rather than their current teaching performance, that counts for the probability to have their mobility request accepted. Our third indicator, the revealed preference indicator, is constructed by counting how many tenured teachers want to leave a given school and how many want to move into the same school; thus we can classify schools according to the degree of preferences received from the whole population of tenured teachers.

All of these three indicators have a large variability across schools that appears remarkable given the lack of concrete autonomy of schools and the existence of centrally defined administrative rules in the allocation of teachers. While we do not attempt to identify, in any econometric sense, the causal effect of our indicators on schools' performance, we do measure their association with pupils achievement at the school level as measured by PISA 2003. These very preliminary exercises are rather encouraging as students performance appears to be negatively related to teachers turnover and to the incidence of tenured teachers mismatched to their school. The revealed preferences indicator is positively correlated to the students performance, showing that teachers (on average) know which are the best learning environments (notwithstanding the lack of standardised exams) and gradually attempt to move there.

2   Motivation and outline of the paper.

Economists look at schools through the lenses of production theory. Teachers, and other inputs, are combined in schools in order to develop students competencies. Such a frame is quite powerful in focusing the attention upon schools effectiveness by relating output (some measure of what students have learnt) to inputs (firstly the number and costs of teachers)[2].

The production theory frame is not a simplistic scheme in which more (teachers) is always better (for students' learning). Actually a massive body of econometric work has shown that the quantities do not matter very much and the teacher to pupils ratio has no clearly discernible impact

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[2] Todd and Wolpin (2003) discuss the general econometric framework and the data requirement for the empirical estimation of an Education Production Function. The specification problems derive from the fact that learning is a cumulative process and therefore genetic traits, family background and the very early years of life and schooling have an enormous impact upon the subsequent school's and labour market performance of a person (Cunha and Heckman (2007)). The family background importance goes beyond the direct parenting activities: actually much of the parents effect, besides its relevance in shaping the genetical endowment of their kids, comes through the residential choice and its implications upon the quality of the children's peers and environment (Harris, 1999).

upon learning[3]. In contrast it is clear that teachers' motivation and quality matter a lot not only through the ability to transmit the content of the curricula but also through their impact upon students' motivation and behaviour.

Institutional arrangements are important determinants of the quality and motivation of teachers as they set the recruitment rules and shape the incentives teachers face in their daily activity (Bishop and Woessmann 2002 for a simple model)[4]. Within a given institutional arrangement it appears that sizable differences in students' learning are associated to the identity of their teachers[5]. For example Aaronson et al. (2007) find that a standard deviation in teachers' effectiveness – as measured by the average change in their students' performance – equals one fifth of the average change associated with one additional year of schooling[6].

However effectiveness of a teacher is only observable ex-post and there is always the doubt that is it contingent on a specific situation. From a policy maker point of view it would be important to be able to predict teacher effectiveness on the basis of ex ante observable characteristics. Unfortunately this is a difficult endeavour. Aaronson et al. (2007) indeed do not find strong links between effectiveness and observable traits, including the credentials used (in that environment) for selecting and paying the teachers. On the other hand Clotfelter, Ladd and Vigdor (2007a and 2007b) – using North Carolina data – show that teachers' experience (at least up to a few years of experience) and quality (as measured by the tests teachers themselves took while graduating) matter[7]. However education credentials may not be always conducive to better performance; for instance having a Ph.D. in the subject taught has no impact upon effectiveness, possibly because the people involved are overqualified and not really motivated to teaching. This example shows that whatever the entry criteria, the composition of the teachers' pool depends on the alternatives jobs available. For instance, the decline over time in the quality of female teachers in the US[8] has been attributed by Hoxby and Leigh (2004) to the evolution of the interplay of relative wages between

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[3] See on this the summaries of the evidence provided by Hanushek (2003) and Krueger (2003).

[4] A stylised fact emerging from the across countries analysis of comparable outcome measures – firstly those provided by PISA – is that the most effective systems are those combining schools' autonomy and strong accountability of results (Fuchs and Woessmann 2007).

[5] The use of standardised tests to identify good and bad performers, at the level of individual students, teachers or schools, is made more difficult by the presence of measurement errors and the risk of inducing a "teaching to the test" behaviour (see Kane and Staiger, 2002). Albeit this may limit the usefulness of those tests in designing appropriate incentive schemes – for schools and teachers – the presence of sizable differences attributable to schools' and teachers' effectiveness is quite robust.

[6] The results refer to 8th and 9th grade students of the public schools in the Chicago area. The impact of having a "good" teacher appears to be more sizable for less able students.

[7] They also find a negative impact of class size (i.e. quantity matters as well) even though the magnitude of the impact is negligible.

[8] The quality has been measured by the results of the tests undertaken by the different cohorts of teachers' applicants at the end of their students' career (see Corcoran et al., 2004).

the teachers and other professions: the increased chances of getting access to other professions – previously basically closed to female candidates – and (more importantly) the compression of teachers wages (vis-à-vis an increase in pay dispersion in the US economy at large) explain why only the least able female graduates have increasingly opted for the teaching profession[9].

To sum up, there is increasing evidence that teachers matter (OECD, 2004). Their quantity matters for the costs of education (as teachers represent about two thirds of the current expenditure for education at the primary and secondary level in the OECD average) while students achievements are much more affected by teachers' quality and motivation. However these two last traits are not easy to build up and to instil through training and experience (albeit some experience matters). Neither they are immediately linked to some specific characteristics easily identifiable ex ante; the connection between observable traits and teachers' quality is often confounded by the fact that the way people select themselves into the teaching profession changes over time depending on the evolution of the overall labour market.

Given these stylized facts, looking at the teachers' labour market in Italy is of potential relevance in order to understand the disappointing performance of the Italian schooling system– as evidenced in PISA and, to a more limited extent, in the other comparable international surveys about the competencies acquired by Italian students[10]. This paper moves from the consideration that the regulation of the teachers' market in Italy creates a contradiction between teachers and school goals that eventually de-motivate the teachers and produce poorly educated students. To support this claim is difficult because there are not direct evidence on teachers' quality and motivation.

Ideally we would like to analyse the forces driving the processes through which Italian teachers are selected and self-select into the profession and the individual schools and to identify their impact upon students' learning. While the information available in the Italian case falls short that required to address this question, we think that it is still worth exploiting the available information in order to uncover the sign and the strength of the correlation between students achievements and several features characterizing the teaching profession. We refer to teachers socio-demographic traits, their labour market behaviour and specific characteristics of the way they are allocated to schools. The bulk of the paper consists in recovering and in synthesizing, in an intelligible way, the relevant information into few crucial variables. As a first assessment of the validity of our indicators we report their correlations with the available measures of students'

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[9] The negative self-selection of males teachers might also explain why, according to the cited Clotfelter et al. paper, female teachers are ceteris paribus conducive to better students' results (even after taking account that having a teacher of the same sex and race of the student has also a positive impact).

[10] For a summary of these disappointing results see Cipollone and Sestito (2007) and Montanaro (2007).

achievement at the school level. These correlations are just a first step in the journey that eventually leads to identify causal links between allocation rules, teachers' observable characteristics, their labour market attitudes, their motivation and quality and students' achievement.

The choice of variables we focus upon is largely dictated by data availability and by the Italian institutional setting. For example in the Italian case teachers' quality cannot be inferred from records of entry exams into the profession due to the absence of such entry tests and any recruiting standards. To overcome this dearth of data and to recover some hints about teachers' quality we look at their demographic characteristics including information about their graduation grades relative to the rest of the population; similarly we try to gain insights about teachers' satisfaction and motivation, that by definition are latent variables, by monitoring their behaviour in the labour market. Finally, in order to look at how the institutional framework may affect students achievement via teachers' behaviour, we examine the effect of recruiting mechanisms on school turnover, teachers' mismatch and revealed preferences.

We exploit several statistical sources. Most of the information about teachers characteristics and labour market behaviour are obtained from the Italian labour force survey (LFS) and the Bank of Italy survey on household income and wealth (SHIW); these two sources allow us to directly compare teachers to other workers; the drawback is the paucity of the details about the teachers' career and (in the case of SHIW) the small sample size. We make use of the administrative school records to construct indicators of teachers turnover, mismatch and revealed preferences.

The next sections are organized as follows. In section 3 we focus upon the composition of teachers' pool in terms of socio-demographic characteristics. Section 4 then compares teachers to other workers in terms of some labour market indicators. Section 5 focuses upon turnover, mismatch and revealed preference indicators. Section 6 finally discusses the relevance of our indicators by showing how they correlate to some standardised measures of students learning. Section 7 concludes.

3   Who are the teachers.

We recover information about the composition of the teachers' pool from the Labour Force Survey where a worker is identified as a teacher according to the description of the primary job held

during the survey's reference week. Notice that we include both people temporarily absent because of paid holidays, sickness etc, and people possibly hired as their replacement[11].

More generally we include both tenured teachers and those hired with a temporary contract (while only a subset of the latter are included in the administrative counts used in sections 5 and 6). There are three types of temporary contracts for teachers in Italy, all included (but not distinguishable) in the LFS. The first type lasts one year, from the 1st September to the 31st August, and it is the most preferred as it covers and pays the period during which there is not teaching activity; in contrast this period is not covered in the second type of temporary contract that ends with the actual teaching activity ("fino al termine delle attivita' didattiche"). These two contracts are used to fill annual vacancies due both to physiological absences and to the fact that tenured teachers are fewer than the actual teaching positions. This shortage of tenured teachers depends on public finance constraints that do not allow the ministry of education to hire with a permanent contract the number of teachers required by administrative rules on the basis of the number and composition of enrolled students[12] (for the public purse temporary contracts are cheaper and less risky than permanent ones). Only tenured teachers (with permanent contracts) and those working with these two types of temporary contract are recorded into the administrative archives that we will exploit in sections 5 and 6. The third type of temporary contract is signed directly by the schools to cover short term vacancies, i.e. vacancies that expire before the end of the academic year. Since these contracts are paid directly by the schools they are not registered into the central administrative archives and therefore are excluded from our analysis in paragraphs 5 and 6. In contrast they are covered by the Labour Force Survey. Thus the number of teachers identified in the Labour Force Survey well exceeds the number of those identified in the central administrative archives, notwithstanding we consider the weekly average number of people having had a teaching engagement over the year rather than the yearly total headcount of people ever teaching over the previous 12 months.

The household survey nature of the data means that we may not identify very well some details of teachers such as, for instance, subjects taught and school. So we limit ourselves to

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[11] In the regressions presented in section 4 we exclude the summer quarter from the analysis in order to avoid problems in the counting of paid holidays and other physical absences related to the summer interruption in teaching activities. Notice that so doing we also avoid problems related to the uncertain definition of those teachers who have been employed with a temporary contract that ends with the actual teaching activity ("*fino al termine delle attivita' didattiche*"). While formally they are not employed (being not covered by a contract over those months), some of them might still classify themselves as employed on the expectation of getting a new temporary contract (or even a tenured position) at the start of the new schooling year.

[12] Several features of these rules coupled with a lack of financial autonomy and accountability at the school level tend to inflate the number of positions and teachers. Italy is characterised by a low students to teacher ratio. We explored these issues in an ad hoc chapter of a previous draft, available to the interested readers upon request.

distinguish between primary, lower and upper secondary schools (considering as a separate group those acting in support of disable pupils and those teaching religion classes), pooling together private and state schools teachers[13]. The great advantage of using the LFS is that it allows a comparison of teachers' characteristics and behaviour with that of other groups of workers[14].

Table 1 presents a snapshot of the composition of teachers' pool, on the basis of age (five age groups), gender, region (the South and the Centre-North) and educational attainment. Tables 2 and 3 replicate the same frame separately for primary and secondary school teachers. It appears that teachers are quite old (adding together the values of the age composition raw pertaining to the two columns relative to 50-59 and 60+ years of age, respectively 36.2 and 4.9%, it appears that about 4 out of 10 teachers are more than 50 years old), predominantly females (the gender composition raw for the all age groups column shows that, in the total of all age groups, 75.7% of teachers are females) and still with relatively low level of education (adding together the two raw relative to lower and upper secondary grades for the rightmost column, relative to all age and gender groups, it appears that 40.7% have no more than an upper secondary grade). Lower educational attainment and old age are more relevant in the South than in the North possibly signalling a geographic stratification of teachers' quality.

Teachers characteristics differ across schools. While always predominant, females are just 2 out of 3 in secondary schools (the precise value is 66.5%; table 2) being ubiquitous in primary schools (where they are 93.4%; table 3). Primary schools teachers are less often college graduates (72.7 per cent of them hold an upper secondary degree) and younger than the rest of the pool. The difference in the educational attainment is a reflection of the different access requirements to the teaching profession; this explains the larger presence of relatively young persons (the share of teachers that are less than 40 year old is 32% and 20 % in primary and secondary school respectively) as primary school teachers may enter relatively soon into the profession. The stronger feminization of primary school teachers is likely a reflection of a traditional and well entrenched perception of different gender roles; over time, the increase in the feminization of the profession (considering the teachers less than 40 years of age females are more than 4 out of 5) is however mostly driven by secondary school teachers. The above mentioned geographical differences – the lower educational attainment and older age of teachers in the South – are however confirmed both in primary and in secondary school.

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[13] Neither in a sampling survey as the LFS we may identify the school principals.

[14] This strategy provides additional information with respect to the two surveys focused upon teachers which have been so far used in Italy in order to analyse composition and behaviour of teachers (see Cavalli, 1992 and Cavalli, 2000). On the other hand the LFS has no specific question about what teachers think about their profession.

The association between these characteristics and teachers quality is far from obvious; while it might be reasonable to associate teachers' low educational attainment to low quality (controlling for type of school and subject taught), it is harder for example to state that primary school teachers are worse than the rest of the pool just because of this lower level of education. As a matter of fact primary school teachers choose such a career by pursuing a specific educational track already at the upper secondary level. While getting a further grade might improve their skills (and actually the current law asks for this) such an early and explicit choice might be a good indicator of a strong motivation. Quite on the contrary, many secondary school teachers are college graduates that opted for the teaching profession only after graduation, without any ex-ante commitment.

Same ambiguity holds for age. On general grounds older teachers may be less effective because a large age gap with their pupils may lead to problems in the student-teacher dialogue; on the other hand aged teachers are also more experienced even though the gains from experience are likely to accumulate only up to a given threshold. In the Italian case the relationship between quality and age is further complicated by the institutional and historical development of the educational system. The quality of the different cohorts within the existing pool of teachers may well depend upon the vagaries of the recruitment process. While almost all existing cohorts have entered the profession without going through a proper selection mechanism, the size of the entrant pools and their origins has fluctuated over time. More importantly, the composition of each cohort of new entrants has subsequently changed as a consequence of a progressive self-selection process. The ones remained in the profession, notwithstanding its relatively flat and seniority based wage profile and the precariousness of its initial steps (as only the transition to a tenured position provides for job security), are either the ones most motivated or the ones unable to find a better outside alternative. We will come back upon this selection mechanism, which unfortunately we do not observe in its details, in section 4, when considering some features of teachers behaviour vis-à-vis the behaviour of other workers.

Again gender composition has no direct bearing on teachers' quality (if any, the US evidence discussed in the previous section would signal a better performance of female teachers). It might contribute to the worse performance of boys students as the paucity of male teachers might weaken the teachers' guidance role in the case of male students. More worryingly, the increasing feminization of the profession might proxy for the declining appeal of the profession, as male workers have more often better alternatives to pursue. Furthermore it might be the case that in Italy, as in other advanced economies, the teaching profession is not, as it used to be, the only available option for the most skilled females.

As an additional indicator of the social status and perceived importance of the teaching profession we looked at the marriage market[15]. Here an hint of motivational factors is the fact that while many male teachers are married with a female teacher, a sizable share of the female teachers have a partner with a higher educational and professional status. In other words, many female teachers are likely to be a secondary earner in their household[16].

More direct considerations about the quality of the teachers pool have been obtained by looking in more detail at their educational attainment. By using the SHIW data, we have computed graduation marks of teachers and other individuals (we considered relative graduation marks within each cohort and study field so as to purge from possible drift over time and across fields in the graduation marks). On average, teachers have better graduation marks than other people, either working elsewhere or currently not employed (Figure 1). So teachers are definitively not less qualified than other workers, even though their better marks might simply reflect a peculiar orientation towards "intellectual" and school-related activities. It is also false that the youngest teachers, especially males, are worse than the oldest; in fact they are slightly better in terms of relative graduation marks. More difficult is to say whether this age gradient reflects an improvement in the quality of new applicants or, quite on the contrary, it simply signals that the best individuals leave the teaching profession after having tested it (and other alternatives) after having graduated. The story of a higher quality of new cohorts of entrants would be a bit puzzling given that there has not been an uplift in the access requirements to the teaching profession[17]; moreover in the next section we will show some results that are consistent with a negative self-selection among those who remain in the profession. However, at this stage we have to conclude that there is no direct evidence that allow us to discriminate between these two hypothesis[18].

4   The behaviour of teachers in the labour market: a comparative exercise

An advantage of using the LFS is that it provides information about the labour market behaviour of teachers and it allows comparisons with other groups of workers. In what follows we

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[15] We follow Schizzerotto (2000) in considering the mating decisions as an indicator of social status.

[16] The detailed results have not been reported for sake of brevity and are available from the Authors.

[17] In theory the law has dictated that new teachers have to pass through a post graduate school (the so called SISS), characterised by an entry selection. Whatever the actual selectiveness of these schools – questionable as there are no strict exit exams for the participants and so the system as such might simply imply a further entry postponement – they had so far no remarkable impact as the applicants passed through the SISS are still the last in the queue of people with an accumulated right to be appointed as a teacher.

[18] We exploit both the panel dimension of SHIW and a pseudo-panel approach to consider the evolution in the quality (as measured by the relative graduation marks) of those teachers who left, those that stayed and those who entered into the teaching profession between 2000 and 2004. However the small sample size of the SHIW data did not allow us to reach robust conclusions.

constructed simple indicators of relevant labour market behaviour and we verified to what extent teachers differ from other workers. The basic idea is to compare the working conditions and labour market behaviour of teachers and other workers and to examine whether being a teacher is associated to those features. Our analytical tool is a regression framework (either a linear or a probit model, depending upon the nature of the left hand side variable) that we use to sort out partial correlation; we start from a simple model (model 1) in which being a teacher is the only right hand side (dummy) variable considered in the specification. Next we move to model 2 where that dummy is inserted along with few other controls for age (the same 5 age groups already considered in tables 1-3), gender, educational attainment (the same 3 groups considered in tables 1-3), geographical area (3 dummies respectively for North, Centre and South) and a dummy identifying public sector employees, as most teachers work anyway for the public sector. In models 3 and 4 the same specification is further enriched by allowing the teacher's dummy to vary according to either the type of school (model 3) or to the age, gender and educational attainment groups (model 4). In all cases we focus upon the teacher dummy, attaching no causal interpretation to the results as we simply look at whether being a teacher is associated to the feature under examination.

The choice of the features and behaviours examined is somehow related to the availability of information in the LFS. We start from some characteristics of the contract (the elapsed job tenure in months, whether the contract is temporary and, if so, its further expected duration in months) and of the actual work behaviour (the weekly hours of actual work and whether the worker was absent from the work during the survey week, whatever the reasons for the absence). The contractual features to a large extent may be interpreted in order to classify the "quality" of the job position, particularly so the temporariness quite often deemed as a synonymous of precariousness in Italy. The working hours quantify a relevant aspect of the work effort[19] – even if the absence of information concerning the earnings do not allow to infer much about the overall working conditions package. The absenteeism indicator quantifies a relevant behaviour which may have direct implications for students performance (see on this Clotfelter, Ladd, Vigdor 2007c) and which, stemming out health factors (unlikely to differ so widely across so broad groups of workers), may be directly interpreted as an indicator of both workers' motivation and the laxity of the monitoring upon workers' behaviour. We complement these indicators with an additional one even more directly related to workers' satisfaction – whether the worker is currently looking for a different job, something which we interpret as an indicator of dissatisfaction and reduced professional motivation

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[19] Notice that the hours of work considered in the survey are not the teaching hours formally due but the actual hours, including the time spent preparing the lectures, the tests correction time etc. as declared by the individual respondent.

– and another one related to the effort and motivation put into the current job, that is whether the worker is holding a secondary job position on top of the principal one. We further verify the existence of at least one different job spell and whether the current work is located in a municipality different from that of residence.

Table 4 provides a summary of the results[20]. The incidence of temporary contracts is confirmed to be larger for teachers than for the other employees. According to model 1 (with no control) teachers have a 5 percentage points increased chance of being on a temporary contract (the average chance for an employee is 12%; column 1). Moreover, their temporary engagements are shorter: the contract duration column (column 10) in the table (again with reference to model 1) shows that being a teacher lowers the residual contract duration by 4.41 months (the overall average is around 13 months). Such an indication of precariousness is not due to the peculiar socio-demographic composition of teachers, as actually moving from model 1 to model 2 the point estimates of the teacher's dummy are enlarged: the chance of being on a temporary contract is 6 percentage points higher in the case of a teacher and the residual duration of the temporary contract is 5.52 months lower in the case of a teacher. On the other hand model 4 shows that the precariousness of the teacher's profession is very much an age related phenomenon related to the entrance in the profession. Model 3 shows that the precariousness is much more intense among teachers in support of disable pupils.

Notice that the precariousness of the teacher profession is not due to the fact that they are new entrants. On average teachers have longer tenure (of 75 months, the overall average being of 126 months; column 11) and are more likely to have had other work experiences before their current work (the actual values change a little bit according to whether the model is estimated in the employees sample – 19 percentage points of difference – or in the overall workers population – 17 percentage points of difference; columns 6 and 7). Most of these differences are however due to compositional factors as the estimated effects shrink considerably when passing from model 1 to model 2 (for the tenure, the difference becomes of 15 months, for the probability of having had a different work experience the effects becomes of 5-7 percentage points according to the comparison group). As such this is evidence that teachers have longer careers composed by spells of employment in other sectors. While these other work experiences may have been quite unsatisfactorily – to some extent they have to be so, as the concerned individual has chosen to become a teacher – people are not trapped into their teaching profession.

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[20] The actual figures change a little bit (particularly the ones concerning the weekly hours of work) when including or excluding (as in the table) the summer months.

Quite interesting are also the figures of the likelihood of being in search for an alternative job (columns 2 and 3), an indicator of dissatisfaction with the current job in our interpretation. As such, teachers are less likely to look for alternatives (according to model 1 they have a negative differential of 3-4 percentage points, depending upon the identity of the comparison group, either the employees or the whole workers' population). Even if this negative gap is entirely due to compositional factors (so that it disappears in model 2), our reading is that teachers' precariousness per se does not lead to a search of alternatives because the overall working package is likely to be relatively satisfactory. Quite interesting is however to look at models 3 and 4 where the teacher effects are differentiated. Male and young teachers along with those in support of disabled students are the most likely to be looking for job alternatives. On the contrary, older teachers, who are not anymore suffering from precarious contractual arrangements, and females, of all ages, are not unsatisfied with their current job (at least given the alternative chances they perceive as available for them).

We have no way to assess the overall working package (albeit something will be said later concerning the hours of work) so that we may not establish the reasons of this apparent appreciation of their current status by teachers. However, an interesting feature to be examined is the presence of a secondary activity. As such, a secondary activity may divert the effort to be put forward in the principal position; at the same time, the possibility to conduct such a secondary activity may be part of an equilibrium in which the principal position is considered attractive not per se but because of the large amount of time and resources left for alternative uses. Overall, teachers are more likely to hold a secondary position in addition to their principal job: using model 1 the difference amounts to 3 percentage points, even if it somehow shrinks to just 1 percentage point when taking account of compositional effects (in model 2). Males teachers are the ones most likely to hold a secondary job. The differences according to age are more negligible (there is a tiny decrease in the probability of holding a second job notwithstanding the above noticed larger decline in the degree of precariousness of the principal position).

The hours of work are the only element of the working package which may be measured in the LFS data. According to our results, teachers enjoy a working week 14.5 hours shorter; the difference is due to compositional factors only to a limited extent (in model 2 the effect shrinks to 11.5 hours per week). The reduced workweek is more relevant for secondary school teachers (model 3) and among males (see model 4), the two things being somehow interrelated; it is also more relevant for highly educated persons. While the descriptive evidence here presented does not allow to identify casual links it is quite plausible that the short working week is a relevant element

of the overall satisfactoriness of the teaching profession and of the fact that teachers, notwithstanding the precariousness often suffered, do not search for alternatives.

Another interesting element is the analysis of the absences. Model 1 shows that teachers are more likely to be absent for the whole working week (a 2 percentage points difference); such an effect shrinks but does not disappear when considering compositional factors (in model 2 the effect is about 1 percentage point). Notice that the absenteeism of teachers is more pronounced among most educated people.

While the evidence so far assembled is inherently descriptive, it seems that, on average, precariousness does not lead to a more diffuse search for alternatives. Our reading is that the overall package is deemed satisfactory by teachers (at least considering the likely alternatives). The reasons for this are likely to be differentiated. To some extent it may be due to the reduced working week, particularly for females, but also to the possibility – inherently related to the reduced working week – to hold a secondary position. There may be differences across age groups, as the precariousness is a feature of youths, who may have to pursue several professional alternatives (both having a secondary activity and looking for alternatives), while for older teachers, that have permanent engagements and do not look for alternatives, holding a secondary position is a way to exploit the short working week at the school; males are likely to either hold a secondary position or look for an alternative, while females are likely to enjoy the shorter work week for its intrinsic value.

Summing up it is difficult to say that teachers working conditions are so poor that a general dissatisfaction emerges, the peculiar career – starting from precariousness and ending to immovability with no selective hiring and retraining policies in between – may have profound negative implications for teachers' effectiveness. Notwithstanding the perspective of a long period of precariousness many young workers are attracted to the profession but lack any specific motivation and quite often are looking for alternatives; older teachers are likely to be those who have not found alternatives and are sufficiently satisfied with the combination of low work load, the possibility to pursue other interests (either a second job or family duties) and the contractual immovability; these amenities compensate the relatively low monthly pay.

5   Consequences of the allocative system: turnover, mismatch and revealed preference

The thrust of this paper is that the way teachers are allocated to schools creates a wedge between teachers incentives and school goals. We try to support this idea by providing some evidence on teachers turnover, actual and desired mobility based on the exploitation of administrative archives. The large flow of teachers across schools is likely to have a negative

impact on students achievement as it is not driven by standard matching effort that both parties, schools and teachers, exert in the attempt to find the most suitable mate; on the contrary teachers are allocated to schools by centrally determined administrative mechanisms, based mostly upon seniority rules and regardless any efficiency or optimal matching consideration. As a matter of fact a typical teacher at the beginning of the carrier spends several years working under temporary contracts and often changing school every single year. By means of this peregrination among schools, she accumulates years of seniority that eventually will allow her to gain a fully tenured position. From that moment onwards she cannot be dismissed nor transferred to any other school without her explicit request[21]. Yet she can always ask to move to another school and her request cannot be refused as long as there are vacancies open and no other applications with higher priority. All these allocation processes occur without any selection of candidates taking place at either the central or the school level; the individual school has no voice in choosing among its own applicants and even no right to refuse the candidates assigned to them by the centrally managed allocation mechanisms. In Italy teachers choose schools, but schools never choose teachers.

The data at our disposal allow us to characterize this allocative mechanism through some school level indicators. Firstly we define a standard measure of job *turnover* at school level using the fact that we know the identity of the person holding a given job in two adjacent years; we are also able to distinguish turnover due to temporary and tenured teachers. In our reading the turnover is an indicator of turmoil in the teaching activity that may hamper the continuity in teaching activity because teachers, and not the school, are in charge of most decisions concerning what actually is done in the classroom. The potentially negative effects of turnover upon teaching effectiveness is further strengthened by the peculiar features of the rules governing teachers' mobility across schools. In the economy at large, turnover is the result of an intense screening activity operated by both sides of the market in search of an optimal match. In the Italian education system instead it reflects two phenomena: the peregrination of temporary teachers whose main motivation is to accumulate seniority rights and the presence of mismatched tenured teachers aspiring to change school. In both cases there is no link between the actual performance and the chances to step up (becoming tenured or getting the desired location) because the allocation of both temporary and tenured teachers to schools is defined according to centrally determined rules that preclude any

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[21] Tenured teachers may be put on mobility if there is a contraction in the enrolment and a reduction in the number of job positions in their school. Such a redundancy scenario is quite unlikely given the many levers (and the few incentives) schools have in order to avoid (to look for) reductions in the number of job positions; even where and when such contraction happens in an individual school, the presence of temporary contracts holders would provide a buffer. In any case the tenured teacher made redundant in an individual schools would acquire the highest priority in the mobility upon request mechanism later on described. All in all tenured teachers are so significantly covered against any mobility risk and fully insured against any redundancy risk.

choice from the school side. The system is not a centralised clearing house market in which the two sides of the market, instead of meeting through atomistic moves, list their priorities then processed, at once, by a clearing house algorithm. These markets – see for a recent survey Niederle e Roth (2007) – allow to avoid the costs associated with the atomistic matching but still are based upon an explicit choice and ranking of choices made by both sides of the market. The actual mechanism present in Italy would be equivalent to a clearing house scheme only in the case all teachers are alike – so that schools have no preference to be expressed, the only relevant rankings being those expressed by teachers with respect to attributes unrelated to the teaching itself (for instance the school's location)

According to the existing rules, tenured teachers that are willing to leave their current school have to file a formal request specifying also their preferred destination; they can list up to 20 desired schools. Whether their request will be satisfied and which of the listed schools will be assigned depend essentially on their seniority. We exploit these mobility lists to construct two additional indicators at the school level. The first is a *mismatch* indicator defined as the share of the tenured teachers present in a school that have actually filled in a formal request to move elsewhere. This indicator can capture the teachers' dissatisfaction with their current school. Our prior is that large mismatch may reduce students' achievement because teachers wishing to leave have a lower motivation in their current activity and lack long term commitment to their current school. Moreover, they have no incentive to well perform in the current school as their behaviour does not change their chances to move to the desired school[22].

The last indicator considers how many teachers would like to move in or out any individual school; for each school we assign value +1 to each teacher working in an a different school that wants to move in[23] and value -1 to each teacher that wants to move out. Our indicator is the arithmetic sum of all the applicants wishing to mover in and out (expressed as a ratio to the school size). This is a *revealed preferences* indicator: a school with a positive balance is a school where more teachers are willing to move in than those who want to move out. Assuming that idiosyncratic preferences are netted out, a school with a positive balance is more likely to have a better schooling environment, which is likely to be reflected in the students' achievement.

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[22] Hanushek et al. (2005) find some evidence that teachers on a move are less effective in their teaching. They consider people who actually move (out of a school, a district school or the whole school system) as the institutional features of the system they look at (Texas in US) do not allow to understand people's intentions.

[23] More precisely we scale the positive values by the number of desired schools listed in the teacher's mobility application.

Notice that we are not in the position to clearly identify the direction of the causation between our indicators and the schools performance (in terms of students' achievements). Besides the standard difficulties in explaining students performances – particularly with the existing Italian data which do not allow for longitudinal observations of individual students and the schools they are enrolled to – there are some ambiguities in the interpretation of the indicators we have just presented. We tend to prefer for the latter indicator – the revealed preferences indicator – an interpretation according to which it measures the quality of the learning environment (whatever the factors behind it, for instance the social background of the students of that school). One might however legitimately assume that a nicer environment, besides possibly stimulating students[24] elicits teachers motivation and effort, so that the indicator truly reflects teaching effectiveness[25]. Specularly, some concerns may be raised with respect to the mismatch indicator as the desire of leaving a given school might simply reflect the perception of a bad learning environment and not the lower motivation of the existing teachers and their effectiveness[26].

5.1   Turnover and turmoil in the Italian schools

We start our analysis by looking at how teachers move across schools. More specifically we constructed turnover measures, using the Davis and Haltiwanger framework, considering for each individual school (about 11000 State schools considering the pre-primary, the primary and the lower and upper secondary education levels) the number of jobs and the identity of the person covering them in two adjacent academic years (2004/05 and 2005/06). Thus we are able to identify whether in the two subsequent years the same chair was covered by one or two teachers. The total turnover measure is simply constructed by adding up all inflows and outflows in each individual school and scaling the sum by the school size calculated as the average number of positions in the two years[27]. Knowledge of the destination and origin of inflows and outflows and the type of contractual engagement allows us to separately identify the components of the total turnover. For

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[24] So triggering a peer effect – for evidence upon such a channel in the Italian context see Cipollone and Rosolia (2007).

[25] Additional sources of concern were suggested to us by a referee stressing the fact that teachers do not posses information about students' actual competences but only about grades and this combined with the presence of other factors impinging upon our indicator (as teachers may be attracted by student/teacher ratios, by proximity, by the social status associated to some schools etc.) in impeding to consider this indicator as a measure of the learning and schooling environment. As a matter of fact we believe that these and other shortcomings are issues to be dealt with empirically, verifying whether our indicator is or is not related to schools performance and which are the learning environment features which are possibly captured and proxied by our indicator.

[26] To disentangle the different effects we would need to analyse the impact of the (intention to) move of a single teacher (upon the students directly concerned) controlling – eventually on the basis of our mismatch and revealed preferences indicators – for the school learning environment. However, we are not yet in a situation in which individual teachers and their students may be matched (within and across schools).

[27] The range of variation of the measure runs from -2 (for a disappearing school) to +2 (for a newly opened school).

instance we know the amount due to retirements or to temporary contracts transformed into permanent.

Our turnover measure is a lower bound of the total workers flows. Indeed, for each year and job position we consider only the principal job holder and not all the people who may have been engaged to fill that position during the year. We therefore exclude teachers hired by the school to fill a short term vacancy due to temporary absence of another teacher (these teachers are not even recorded in the administrative files here used; see section 3). Moreover we do not consider all the within-year turnover at the school level, which may be quite sizable[28].

In our interpretation the turnover measure is an indicator of turbulence and turmoil in the teaching activity. In the Italian system the team of teachers working on the same class is in charge of planning and organizing the teaching activity within an institutional framework in which school principals have very limited managerial power and coexist with a powerful central authority dictating even the details of the syllabus. The actual decision power is very much tilted towards the teachers' group (and the individual teachers) as the lack of common and standardised exams implies that the individual teachers, who are in principle supposed to transmit to students a centrally decided content, are the real masters of the game. In such a system, the arrival of a new teacher may be disruptive because of the unforeseeable changes she may introduce, while the school cannot pursue any educational project by means of a specific recruiting policy[29].

As a matter of fact when a new teacher arrives in a school it happens because she is entitled to get that job on the basis of her position in a complex system of seniority regulated waiting lists rather than in accordance to some criteria decided at the school level. Roughly speaking one can imagine that the available vacancies are firstly allocated to the already tenured teachers who aspire

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[28] There are two main sources of this intra-year mobility. The first case occurs when a teacher who was supposed to cover a position for the whole year becomes unable to teach until the end of the school year and need to be substituted. Our data do not allow us to take into account this substitution as we only observe the identity of the job holder at a given date during the year. The second case occurs because at the beginning of the school year many temporary teachers are allocated to a school on a transitory base and can be reassigned within few weeks. Albeit here not measured, this "musical chairs" game within the year is quite sizable, because of the possibility for temporary contract teachers to queue up for several positions; moreover the purely administrative nature of the allocation system might elicit further turnover because teachers who perceive unjust their allocation (or lack of allocation) may appeal to the Courts that might reverse the initial administrative allocation. Generally speaking the priority rules in these allocations of temporary workers as well as in the appointment of newly tenured teachers are governed by seniority principle. However, the system is segmented into many different lists and the details of the priority rules may be changed from time to time – furthering the scope of judicial litigation – as a consequence of unions' led bargaining and political interventions.

[29] Just as a simple example considers the choice of the textbooks that is decided well in advance of the beginning of the school year by a team of teachers that only seldom will not change its composition by the time of the opening of the school. Since this early choice needs to be confirmed by the actual teachers allocated for the whole year there is an implicit value for families to wait buying textbooks until later on in the school year when the chances of further changes in the teachers team and of the textbooks adopted are limited.

to change their school. By filling the available vacancies they free up other vacancies, triggering a vacancy chain. Some of the vacancies still left unfilled by tenured teachers are subsequently occupied by other teachers that get a permanent status. Who they are depends upon the position they had into special waiting lists. Those who occupy positions in these lists that are too low to be appointed as tenured teachers may still get access to the remaining vacancies assigned on a yearly basis[30]. The individual school has no voice in this process. Only for shorter term engagements (the ones here not considered) there is some room of manoeuvre for the individual school who may hire from a list of people who specifically applied for a temporary contract in that school. This is however a residual system that is important mostly because it allows "would be" teachers to start teaching and thereby the entry and the accumulation of seniority right in the above depicted waiting lists. So it constitutes an entry port into the above depicted system of waiting lists[31] not an alternative mechanism: neither the school nor the teacher are very keen in finding a long-run potential mate.

In such a seniority based system, teachers do not have any incentive to be effective. Even those hired with fixed term contract, that live in a condition of great uncertainty about their own working future, do not see any link between how well they teach and their chances of being retained and rewarded as tenured teacher in the individual school. Their ability and motivation is not evaluated by the school and has no impact whatsoever on their future chances, in that school or elsewhere. This is a striking difference between the teaching profession and the rest of the economy. In the economy at large temporary contracts are often used as screening devices that trigger a supplement of effort from the worker side; this is not the case in the education system, where the segmentation between temporary and permanent contracts, besides producing an equity problem, lowers worker's commitment without affecting worker's effort. Furthermore, similar considerations apply also to tenured teachers. Their chances to move to their most preferred school are related only to seniority and other administrative features, rather than to the choice of the school (something which should improve the quality of the matching) or their teaching performance, somehow evaluated, in the current school.

For the whole country the value of the turnover is 0.47, that is the sum of the entries and exits into the average school is equal to almost 50 per cent of the total number of teachers in the

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[30] For the reasons and the types of contract used for these yearly assignments see the discussion in section 3.
[31] Being used only for rather shorter term appointments the system has not enlarged very much the scope for autonomous recruiting policies at the school level. At the same time, its use as an additional entry to the waiting lists has allowed to sidestep the formal requirement, formally introduced since 1999, that the applicants to a teacher position should pass through a special post graduate school (the so called SISS; see footnote 18).

school (Table 5, column 1). The value grows as we move from primary to upper secondary schools. On top of that, there is a large variability across individual schools. For the whole country the standard deviation is equal to 68 per cent of the average value. This ratio is very large in the pre-primary schools and declines moderately in the other order of schools. In the South the variability as a ratio of the average value is the highest for all levels of school. Among upper secondary schools there is little turnover only in the lyceum track; in other types of school the number of entries and exits are well above 50 per cent of the teachers pool: it is 75 per cent in vocational schools. These patterns might be influenced by specific characteristics of the schools. In order to fully explore this possibility we used a simple regression framework. The turnover indicator computed for each individual school is regressed upon a few possible determinants of turnover - the gender and age composition of the initial stock of teachers, the shares of temporary contracts and support staff for disable pupils in the initial pool, a set of dummies pertaining to the change in the number of students (positive changes, negative changes and negligible changes) as driving factor of the likely changes in the number of job positions – as well as a set of provincial dummies, and dummies relative to the municipality size. The regressions have been conducted separately for 4 orders of schools (primary, lower and upper secondary, and the pre-primary schools[32]); in the case of primary schools we also inserted a dummy indicating whether the municipality is in a mountain area and for the upper secondary schools a set of dummies for the different education tracks. As expected the turnover is positively associated with the presence of temporary contracts and teachers supporting handicapped pupils. However, these are not the only relevant factors and a lot of residual variability remains, both across and within provinces. In the third column of table 5 we present average turnover by the geographical area (computed as average of the provincial dummies) and by type of school (using the estimated dummies inserted for the upper secondary schools) net of the indicated controls.

Netting from the available controls (inter alia netting from the effects of an higher incidence of temporary teachers) it turns out that turnover is much smaller in the North than in the Centre and in the South. This pattern seems to hold in all levels of school from pre-primary to upper secondary. For the latter there are very large differences between academic oriented schools (lyceum) and technical or vocational schools (again netting from controls and the higher incidence of temporary contracts). Far from being conclusive, these results appear coherent with our interpretation that the

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[32] The results for the pre-primary level are less significant because the State schools here considered (which incidentally are characterised by a level of turnover slightly lower than the average) cover a much lower fraction of the whole market. Our data also exclude the provinces of Aosta, Bolzano and Trento.

turnover indicator may be negatively related to teaching effectiveness as the worse performance of Southern and vocational schools is quite well known.

The information at our disposal allow us to dig further into the determinants of turnover. In particular in Table 6 we decompose the flow of teachers entries in every single school in its basic components.

On average a school changes 22 per cent of its teaching staff every years. Temporary teachers that represent about 15 per cent of the total average stock, account for most of this entry (13.3 per cent): 2.2 per cent is due to temporary teachers that get a permanent position (column 2), 4.1 per cent are new teachers hired with a temporary contract (column 5) and 7.0 per cent are temporary teachers that change school. The rest of temporary teachers either does not get a new yearly contract (about 1 out of 10 temporary teachers)[33] or remains in the same school. The total entry flow is further fuelled by the presence of tenured teachers moving towards their preferred school; these flows account for about 7% of the total positions (column 1), approximately one third of the total mobility in entrance into the schools. There are large geographical differences. In the North, entries are mostly due to the presence of many temporary contract teachers. In this area about one fourth of the total entry flow is due to permanent teachers; at the same time not tenured teachers have larger chances to get a renewal of the yearly contract or to become permanent, even in the same school they are currently working. In the South, on the contrary, the contribution of the permanent teachers to total mobility is larger.

5.2   Mismatch and revealed preference of teachers.

In the previous section we defined and showed an indicator of turnover that we interpreted as a measure of turmoil in the teaching activity. We showed that it is not explained by and uniquely related to the presence of temporary contracts and to the centralised seniority based system through which these are renewed and eventually transformed into permanent contracts. Actually, a quite similar centralised seniority based system governs tenured teachers' mobility and contributes to the turmoil in the teaching activity. In this section we further explore some implications for teaching effectiveness of this latter system.

Basically we exploit the administrative archives that constitute the information basis of the system governing the voluntary mobility of tenured teachers. Every single tenured teacher can apply

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[33] Not necessarily these people end up into involuntary unemployment. They might have refused the contracts offered to them, possibly because they did not need to accumulate further work experiences in order to advance into the lists. Unfortunately we do not identify the refusals.

for moving to a different school by filling up a form in which she lists her preferences. Whether these aspirations will be met or not depends upon a complex set of administrative norms unrelated to her current teaching performance. We use this information about the preferences expressed by teachers to derive a measure of the commitment of teachers to a long run relationship with their current school. In our interpretation the fact that a large share of tenured teachers aspire to leave their current school is a symptom of their little motivation to teach in that school; indeed to the extent that they have good chances to leave that school, they could be quite uninterested to establish good lasting relationships with their colleagues and their students. Therefore the incidence at the school level of tenured teachers that express the desire to leave can be a measure of the average teachers' motivation. We named this incidence the *mismatch* indicator[34].

The second source of information at our disposal comes from the fact that the teachers willing to move fill a form that includes up to 20 preferred schools (ordered according to each individual preferences). Thus for each individual school we construct an indicator of the net revealed preferences expressed by the whole population of tenured teachers. In such an indicator we give a negative value to the occurrence of a teacher that wants to leave a given school and a positive value (scaled up in order to take account that each individual may list up to 20 desired moves) to the circumstance that a teacher wants to be transferred to a given school. As in the aggregate we are netting out from the idiosyncrasies related to individual preferences, this *revealed preferences* indicator is telling of the average judgement about every single school as expressed by tenured teachers, who are likely to be the most informed people in the system. To the extent that teaching is easier in schools well functioning and with better students (whatever the cause, possibly just because of their social background), these revealed preferences contain a judgment about the different schools' performance.

We tend to interpret the mismatch indicator as a measure of the motivation of the teachers currently acting in a given school and the revealed preference indicator as a measure of the overall judgement about the teaching environment present in a given school. In this interpretation the first indicator could have a direct impact on school performance through teachers motivation; the second indicator should also be related to those determinants of individual school performance but not through teachers' effectiveness. As already said, there are however several confounding elements that render ambiguous the interpretation of these indicators that we are not in a position to solve

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[34] The mismatch indicator at the individual school level will be expressed as a ratio to the tenured teachers, the ones allowed to file a mobility request. The aggregate data in table 7 will consider the number of teachers who have filed a request as a ratio to both the total pool of teachers (including those engaged with a yearly contract) and the tenured ones.

out: a poor students' performance, with too many students difficult to deal with, might cause teachers to desire a move (and a high mismatch indicator) and a good learning environment, as captured by our revealed preferences indicator, might elicit additional effort by the teachers.

Turning to the results presented in table 5 it appears that in the aggregate 17.6% of the tenured teachers would like to leave their current school (column 4). Mismatch is higher in the South (also within each order of schools) and it grows going from pre-primary to secondary schools; here it more than doubles as we move from more academic oriented tracks toward technical and vocational schools. Both facts square rather well with what it is known about the quality of the different schools. Again we are interested in understanding whether the geographical variation is real or simple mirror variability in observable characteristics of school. We use as controls the same list of covariates used in the analysis of turnover in the previous section, so as to purge somehow from the fact that schools which are likely to have a larger turnover have also more request of mobility; as for turnover we run separate regressions for the different order of schools (and with additional controls in the case of primary and upper secondary schools, where educational tracks have been considered); results are presented in column 6 of table 5. Both the geographical differences and those among tracks of the upper secondary education are confirmed netting out from the available controls. Notice that the geographical gap is so notwithstanding the fact the presence of many southern born teachers working in the North who aspire to move back to the South. The most likely reason is that they do not wait for vacancies in their most preferred school but are willing to move in any school closer to their final destination; thus when arriving in the South many of them still remain on the move.

As for the demographic characteristics of the people who file the mobility request table 7[35] shows that there is not gender differences, while there is a strong gradient by age and tenure. The indicator is highest among recently tenured (and younger) teachers: 97% of them aspire to move into a new location; this large value of the mismatch depends on the fact that these people have accepted a position in that school just as a way to access to the permanent worker status. The mobility across schools however continues well after that initial stage: 10% of the teachers with 10 or more years of tenure (in the permanent status) are still looking for a different school.

Turning to the revealed preferences indicator it is worth to stress that by construction what matters is its variability across schools. In a system in which only idiosyncratic elements drive the mobility of teachers because all schools are alike in their "fundamentals" – which is what in

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[35] The numbers of table 5 and 7 may differ because in the former they are unweighted averages at school level.

principle should be in a centrally regulated system like that in Italy – all schools should have a value of the indicator about equal to zero (with no many differences in the numbers of those who want to leave and those who want to enter into that school). Quite on the contrary, there are large and systematic differences across schools. Schools in the North are more preferred than those in the South, and pre–primary and upper secondary school score highest (table 5, column 7). It does not surprise the fact that academic oriented schools are the most preferred by teachers. As before in order to understand whether these differences are systematic, we focus upon the differences across provinces and, within the upper secondary level, across the different tracks controlling for observable determinants. The last column of table 5 presents the means adjusted for the usual observable characteristics. According to the revealed preferences indicator the schools in the South remain the least preferred even in the adjusted data. Notice that this results holds notwithstanding the fact that most geographical mobility is from South to North; it appears that northern teachers apply only for schools located in the north while southern ones apply everywhere. As for the secondary school tracks the least wanted are vocational and technical schools, which are actually often considered to be the lowest quality segment in the Italian system. At the other extreme are the lyceums.

All in all our reading is that considering both the mismatch indicator, interpreted as a proxy for the motivation of the current teachers, and the revealed preference indicator, interpreted as a summary measure of the judgement made by well informed subjects about the quality of the different schools, there are quite large and systematic differences across schools. Broadly speaking, our indicators are coherent with the identification of the areas of the system considered as more problematic, that is the South, the lower secondary education level and the vocational upper secondary schools.

6 Basic correlations

Our aim in this paper was describing and measuring some stylised facts of the teachers' labour market in Italy. On the basis of our interpretation of the institutional set up and its actual functioning we also constructed some indicators that allows us to measure the effect of the system of recruitment and allocation of teachers for each individual school. Our aim was not that of explaining the performance of the Italian education system on the basis of these indicators. Yet, understanding whether these indicators are associated to the dismal performance of the Italian system is an important preliminary test towards the identification of a possible causal relationship.

At this stage the dearth of data about pupils' achievement in every single school limit our ability to conduct a systematic examination over time and across schools[36]. As a very first run, we limit ourselves to the differences across (about 400) upper secondary schools as captured by PISA 2003. Thus we look at the sign and the size of the correlation at the school level between our indicators and PISA results.

This is a very limited picture as PISA covers only the 15 years old students so leaving aside the primary and the lower secondary schools. Moreover the academic accomplishments of those 15 years old students are not uniquely related to the upper secondary schools they are currently attending. Actually they had been in that school for no more than 2 years; therefore their PISA achievements also reflect their family and individual background and the quality of the schools they attended at earlier stages. To some extent we take account of these confounding elements by looking also at regression adjusted PISA data[37]; we consider four blocks of regression adding progressively more controls; we start with our three indicators, then we add controls for basic characteristics of students such as gender and family background; next we add provincial and track dummies and finally we include the school controls already used in the previous section to purge our three indicators[38]. As performance variable we choose the score in math of each students as PISA 2003 focused upon mathematics (however we had run similar results for the other items considered by PISA 2003). Standard errors are clustered at school level. Our analysis differs from that conducted by Bratti, Checchi and Fillippin (2007) that used a fully fledged model to decompose the variance of the of the PISA results; while having a much less rich set of controls, we attempt to focus less on traditional school input and more on proxies of teachers effort and motivation.

Admittedly, our exercises are far from identifying a pure school contribution to students' achievements as we do not separate the effect of taking courses in a given school from the sorting of students in that school. At any rate we have discussed at length how the nature of our indicators does not allow any casual interpretation of their link with the PISA results in terms of the impact of teachers upon students' learning. To reinforce this caution we need to add that our indicators refer to years 2005-06 and, albeit we suspect they are quite stable over time, may not have "caused" the PISA 2003 results.

The results, in table 8, are rather encouraging. Students' performance is negatively associated to both turnover and mismatch, in all but one case; for turnover the association is

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[36] Cipollone and Sestito, 2007 and Montanaro, 2007 for a full description of the data on students achievement.

[37] See Bratti, Checchi and Fillippin (2007) for a fully fledged analysis of the PISA determinants.

[38] Notice that the most important among these controls pertain to the incidence of temporary contracts, already shown as a variable possibly related to PISA results by Bratti et al. (2007).

statistically different from zero in all specifications even though the strength of the association shrinks as we include more controls. It is remarkable that it remains significant also when controlling for the incidence of temporary teachers, which may affect turnover as well as having a direct impact upon students' performance through teachers' experience and motivation. The effect is not negligible: one standard deviation in the turnover is associated with a PISA score lower by 17 points (using results from model 1 with no controls). This a relevant effect that is equivalent to about half year of school. The effect becomes smaller, about 4 PISA points, using the results with all controls. Association with mismatch is less robust from a statistical point of view; it basically disappears when we include in the regression provincial and educational tracks. However the strength of the association is remarkable in Model 1 with no controls as one standard deviation of mismatch is associated with a lower score of 50 points, more than one year of schooling. Finally association with the revealed preference indicator is always positive, as we expected, even though it is weak from a statistical point of view. While these are only preliminary results our reading is that the rules governing the teachers market may have an impact on students achievement that is worth to be further explored.

7 Conclusions

In this paper we have shown that there are not specific observable characteristic of teachers that can be easily linked to their effectiveness in the classroom. In contrast the rules governing the teachers market seem to shape teachers behavior in such a way to drive an edge between their incentives and school goals. We have characterized this market with the use of three indicators that highlight three important features of this segment of the labor market: turnover, mismatch vis-à-vis the current school and preferences expressed towards different school locations. We consider the first indicator as a measure of the turmoil in the school; the second as a measure of the mismatch between teachers and the school where they are currently engaged; we expect both indicators to have a negative effect on students achievement; the last indicator measures the ability of schools to attract teachers which we tend to think somehow captures school quality and therefore we expect to be positively correlated with pupils achievement. Empirically it turns out that the distribution of the three indicators by geographical area and type of schools is coherent with the general perception about what are the best schools; furthermore, the three indicators appear correlated as expected with the school's averages of PISA 2003 scores in mathematics (even controlling for some standard factors affecting students performance).

These results are only preliminary and several strands of research appear worth to be pursued. On one side, the characterization of the teachers labour market would need to be enriched

by looking more explicitly at the processes through which teachers enter and decide to remain into the profession. On the other side, the analysis of the impact of our indicators upon school's outcomes need to be enriched – by considering a wider range of school outcomes such as drop out rates, repetition rates and scores in the national tests covering the universe of Italian schools – and refined in order to better disentangle casual effects from spurious correlations. As somehow anticipated, we believe longitudinal observations are necessary in order to separately identify the valued added provided by a given school and the differences in the pool of students enrolled by each school. With specific reference to our indicators we are fine tuning them in order to separately identify the possible effects of teachers' tenure and turmoil – both at present caught by our turnover measure – as well as to distinguish between the lack of motivation of people on the move and the (general perception of) quality of the learning environment – at present somehow jointly captured by the mismatch and revealed preferences indicators.

Yet our results are already suggestive of the many pitfalls of current teachers' recruitment and allocative system. As here described, it is clear that it does not guarantee an high enough quality level. The initial screening is almost absent and no relationship exists between a teacher's practice and performance and the subsequent passage to a tenured position. The long and seniority based waiting lists used for this purpose imply that the individuals who stay on to become a teacher may be either those very motivated – a positive feature, of course – or those unable to find alternatives and attracted to the teaching profession precisely because of its lack of monitoring, the reduced working hours and the possibilities to pursue other goals (a secondary job activity, the household etc.). Moreover, the centralized and burocratic allocation system leaves no room for the schools to pursue an active role in selecting and motivating their own teachers. Teachers may end up always waiting for some burocratically engineered step in their career, being poorly motivated in their current teaching activity. This unnatural amputation of one side of the market – as schools are rather passive in these processes in which only teachers are allowed to make their choices and wait for them to materialize in due time and after enough seniority has allowed them to get what they want – does not contrast the inequalities within the system which many fears would be associated with a more decentralized set-up. Possibly because teachers are the only subjects relatively well informed in a system lacking a proper comparability of exams and grades across different schools, the majority of the teachers are willing to move towards the schools where, possibly because of their social background and support from the local community, students fare well. No compensatory policy is therefore put in place and problematic schools are left with poorly motivated teachers and high turmoil, as the teachers there working are just waiting to move elsewhere. The absence of schools' competition in attracting households and resources so does not prevent the presence of

wide inequalities across schools and learning environments (actually, to the extent that better off households have better information in a context lacking properly comparable exams and grades, they may more easily select the high quality schools without having to pay any extra-fee).

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Socio-economic characteristics of primary and secondary school teachers: years 2005
(percentage values)

Education		Age Group																
	<=29	30-39	40-49	50-59	60+	All	<=29	30-39	40-49	50-59	60+	All	<=29	30-39	40-49	50-59	60+	All
	Male						Female						All					
Italy																		
Lower secondary	0.0	1.8	0.7	0.7	1.3	0.9	0.2	0.2	0.8	0.4	0.5	0.5	0.2	0.5	0.7	0.5	0.9	0.6
Upper secondary	33.0	34.6	34.8	32.8	35.7	34.0	47.4	40.7	42.8	39.5	59.7	42.0	45.4	39.6	41.0	37.7	48.0	40.1
College or more	67.0	63.6	64.5	66.4	63.1	65.0	52.3	59.0	56.4	60.1	39.7	57.5	54.4	59.9	58.3	61.8	51.1	59.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Age composition (within gender)	2.6	16.2	31.7	39.8	9.7	100.0	5.2	22.9	33.6	35.0	3.3	100.0	4.6	21.3	33.1	36.2	4.9	100.0
Gender composition (within group)	13.9	18.5	23.3	26.8	48.6	24.3	86.1	81.5	76.7	73.2	51.4	75.7	100.0	100.0	100.0	100.0	100.0	100.0
Center and North																		
Lower secondary	0.0	2.8	0.6	0.8	0.2	1.0	0.3	0.2	0.9	0.6	0.1	0.6	0.3	0.7	0.8	0.7	0.1	0.7
Upper secondary	31.1	29.2	35.4	27.7	32.5	31.2	45.2	42.6	42.1	37.4	55.2	41.3	42.9	40.1	40.5	34.9	43.2	38.8
College or more	68.9	68.0	63.9	71.5	67.3	67.9	54.5	57.2	57.0	62.0	44.7	58.2	56.8	59.2	58.7	64.5	56.7	60.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Age composition (within gender)	3.8	16.7	33.8	35.8	9.9	100.0	6.2	23.7	34.8	32.5	2.8	100.0	5.6	22.0	34.6	33.3	4.5	100.0
Gender composition (within group)	16.5	18.4	23.7	26.1	53.1	24.2	83.5	81.6	76.3	73.9	46.9	75.8	100.0	100.0	100.0	100.0	100.0	100.0
South																		
Lower secondary	0.0	0.2	0.7	0.7	3.0	0.8	0.0	0.2	0.6	0.1	1.0	0.3	0.0	0.2	0.6	0.3	1.9	0.4
Upper secondary	44.4	43.0	33.9	38.6	40.4	38.2	52.8	37.7	44.0	42.1	64.4	43.1	52.2	38.7	41.7	41.2	54.1	41.9
College or more	55.6	56.8	65.4	60.7	56.6	61.0	47.2	62.0	55.4	57.8	34.6	56.6	47.8	61.1	57.7	58.6	44.1	57.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Age composition (within gender)	0.9	15.4	28.7	45.6	9.4	100.0	3.8	21.8	31.7	38.7	4.0	100.0	3.1	20.3	31.0	40.4	5.3	100.0
Gender composition (within group)	7.2	18.7	22.7	27.6	43.0	24.5	92.8	81.3	77.3	72.4	57.0	75.5	100.0	100.0	100.0	100.0	100.0	100.0

Source: *Labour Force Survey*

Table 2

Socio-economic characteristics of primary school teachers: years 2005
(percentage values)

Education	<=29	30-39	40-49	50-59	60+	All	<=29	30-39	40-49	50-59	60+	All	<=29	30-39	40-49	50-59	60+	All
	Male						Female						All					
Italy																		
Lower secondary	0.0	1.3	0.7	0.6	0.0	0.7	0.2	0.0	0.5	0.3	0.7	0.3	0.2	0.1	0.5	0.3	0.6	0.3
Upper secondary	52.6	61.3	63.9	62.6	97.5	64.6	66.5	62.1	78.9	75.9	91.3	73.3	65.9	62.1	78.1	74.8	92.0	72.7
College or more	47.4	37.4	35.3	36.8	2.5	34.7	33.3	37.9	20.6	23.8	8.0	26.4	33.9	37.8	21.4	24.9	7.4	26.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Age composition (within gender)	3.4	23.2	26.5	40.5	6.5	100.0	5.5	26.5	32.7	31.4	3.9	100.0	5.3	26.3	32.3	32.0	4.0	100.0
Gender composition (within group)	4.2	5.8	5.4	8.3	10.6	6.6	95.8	94.2	94.6	91.7	89.4	93.4	100.0	100.0	100.0	100.0	100.0	100.0
Center and North																		
Lower secondary	0.0	2.0	1.8	1.1	0.0	1.4	0.4	0.0	0.7	0.4	0.0	0.4	0.3	0.2	0.8	0.4	0.0	0.4
Upper secondary	52.6	43.9	65.4	53.3	92.3	54.6	61.8	60.7	78.4	74.5	90.6	71.7	61.3	59.7	77.9	72.7	90.8	70.6
College or more	47.4	54.1	32.8	45.6	7.7	44.0	37.8	39.3	20.8	25.1	9.4	28.0	38.4	40.2	21.3	26.9	9.2	29.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Age composition (within gender)	6.2	27.6	19.9	42.4	3.9	100.0	6.1	28.0	33.8	29.3	2.8	100.0	6.1	28.0	33.0	30.1	2.9	100.0
Gender composition (within group)	6.3	6.1	3.7	8.7	8.5	6.2	93.7	93.9	96.3	91.3	91.5	93.8	100.0	100.0	100.0	100.0	100.0	100.0
South																		
Lower secondary	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.2	0.2	0.0	0.0	0.1	0.2	1.0	0.2
Upper secondary	0.0	92.8	62.9	74.7	100.0	76.3	74.8	64.4	79.6	77.6	91.8	75.6	74.8	65.9	78.3	77.3	92.8	75.7
College or more	0.0	7.2	37.1	25.3	0.0	23.7	25.2	35.6	20.3	22.2	7.0	24.2	25.2	34.1	21.6	22.5	6.2	24.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Age composition (within gender)	0.0	18.0	34.2	38.2	9.6	100.0	4.6	24.5	31.2	34.4	5.4	100.0	4.3	24.0	31.4	34.6	5.7	100.0
Gender composition (within group)	0.0	5.4	7.8	7.9	12.1	7.1	100.0	94.6	92.2	92.1	87.9	92.9	100.0	100.0	100.0	100.0	100.0	100.0

Source: *Labour Force Survey*

Table 3

Socio-economic characteristics of secondary school teachers: years 2005
(percentage values)

Education	<=29	30-39	40-49	50-59	60+	All	<=29	30-39	40-49	50-59	60+	All	<=29	30-39	40-49	50-59	60+	All
	Male						Female						All					
Italy																		
Lower secondary	0.0	0.1	0.1	0.4	0.0	0.2	0.0	0.0	0.4	0.2	0.1	0.2	0.0	0.0	0.3	0.3	0.0	0.2
Upper secondary	22.2	25.3	28.0	27.1	36.5	27.7	8.4	10.1	9.1	12.4	21.8	11.0	12.5	14.3	15.3	17.5	29.6	16.6
College or more	77.8	74.5	71.9	72.5	63.5	72.1	91.6	89.9	90.5	87.4	78.1	88.8	87.5	85.7	84.4	82.2	70.4	83.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Age composition (within gender)	2.3	14.1	33.6	43.1	7.0	100.0	2.8	18.4	34.8	40.9	3.1	100.0	2.6	17.0	34.4	41.6	4.4	100.0
Gender composition (within group)	29.3	27.7	32.7	34.6	53.1	33.5	70.7	72.3	67.3	65.4	46.9	66.5	100.0	100.0	100.0	100.0	100.0	100.0
Center and North																		
Lower secondary	0.0	0.0	0.0	0.8	0.0	0.3	0.0	0.0	0.2	0.3	0.1	0.2	0.0	0.0	0.1	0.5	0.1	0.2
Upper secondary	18.7	21.4	29.3	21.4	36.8	25.2	2.4	13.9	8.4	11.2	26.7	10.9	7.7	15.9	15.4	14.5	31.4	15.5
College or more	81.3	78.6	70.7	77.8	63.2	74.5	97.6	86.1	91.4	88.5	73.2	88.9	92.3	84.1	84.5	85.0	68.5	84.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Age composition (within gender)	3.3	14.2	37.7	38.9	5.9	100.0	3.4	18.6	36.3	38.5	3.2	100.0	3.3	17.1	36.8	38.6	4.1	100.0
Gender composition (within group)	32.4	27.0	33.4	32.8	47.0	32.6	67.6	73.0	66.6	67.2	53.0	67.4	100.0	100.0	100.0	100.0	100.0	100.0
South																		
Lower secondary	0.0	0.3	0.4	0.0	0.0	0.2	0.0	0.0	0.6	0.0	0.0	0.2	0.0	0.1	0.6	0.0	0.0	0.2
Upper secondary	40.1	30.7	25.7	33.1	36.2	31.0	24.1	4.5	10.4	14.0	14.1	11.3	27.3	12.0	15.2	21.0	27.4	18.1
College or more	59.9	69.0	73.9	66.9	63.8	68.8	75.9	95.5	89.0	86.0	85.9	88.5	72.7	87.9	84.2	78.9	72.6	81.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Age composition (within gender)	0.9	13.9	28.2	48.6	8.5	100.0	1.9	18.3	32.5	44.4	2.9	100.0	1.5	16.7	31.0	45.9	4.9	100.0
Gender composition (within group)	19.8	28.8	31.5	36.8	60.4	34.7	80.2	71.2	68.5	63.2	39.6	65.3	100.0	100.0	100.0	100.0	100.0	100.0

Source: *Labour Force Survey*

Table 4

Comparitive labour market behavior of teachers in primary and secondary school (1)

(the sample includes all employees, unless diffently indicated)

Models	Indicator											
	1	2	3	4	5	6	7	8	9	10	11	12
	being on a fixed term contract	looking for another job (2)	looking for another job	holding a second job position (2)	holding a second job position	having had a previous work exper. (2)	having had a previous work exper.	weekly hours of work (2)	Absent from work (2)	expected further contract duration - in months (3)	Tenure (in months)	Working in a different municipality (2)
Model 1												
Teacher dummy	0.05	-0.03	-0.04	0.03	0.03	0.17	0.19	-14.49	0.02	-4.41	75.03	0.02
Standard error	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.17	0.00	0.22	1.83	0.01
Model 2												
Teacher dummy	0.06	0.00	-0.01	0.01	0.01	0.05	0.07	-11.46	0.01	-5.52	15.35	-0.03
Standard error	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.20	0.00	0.42	1.52	0.01
Model 3												
Dummy for teacher in primary school	0.04	-0.02	-0.02	-0.01	-0.01	0.11	0.11	-8.01	0.01	-6.32	20.48	0.02
Standard error	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.23	0.00	0.44	2.15	0.01
Dummy for teacher in lower secondary school	0.10	-0.01	-0.01	0.01	0.01	0.03	0.05	-12.44	0.00	-5.30	14.76	-0.10
Standard error	0.01	0.01	0.01	0.00	0.00	0.02	0.02	0.36	0.01	0.50	3.42	0.02
Dummy for teacher in upper secondary school	0.07	0.00	-0.01	0.02	0.01	0.01	0.03	-12.86	0.00	-5.01	10.90	-0.06
Standard error	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.27	0.00	0.54	2.31	0.01
Dummy for teacher of religiuos subject	-0.05	-0.05	P.F.	-0.01	-0.01	0.31	0.39	12.61	-0.03	4.94	91.78	0.26
Standard error	0.02	0.00		0.00	0.00	0.04	0.04	1.77	0.01	7.27	12.73	0.04
Dummy for teacher supporting disable students	0.11	0.06	0.05	0.01	0.00	-0.07	-0.07	-7.07	0.03	-5.33	-26.98	-0.13
Standard error	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.80	0.02	0.93	4.60	0.03
Model 4 (3)												
Teacher dummy	0.28	0.05	0.04	0.02	0.02	0.03	0.06	0.51	-0.02	3.34	-23.67	0.02
Standard error	0.09	0.02	0.02	0.01	0.01	0.08	0.09	3.08	0.02	9.91	19.05	0.09
Interaction teacher dummy with age group												
<= 29	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.
Standard error												
30-39	0.00	-0.03	-0.03	-0.01	-0.01	0.09	0.12	0.82	-0.02	6.61	3.59	0.06
Standard error	0.02	0.01	0.01	0.00	0.00	0.04	0.04	0.90	0.01	0.67	2.64	0.04
40-49	-0.08	-0.04	-0.05	-0.01	-0.01	0.14	0.18	1.55	-0.02	7.37	37.37	0.15
Standard error	0.01	0.00	0.00	0.00	0.00	0.04	0.04	0.86	0.01	0.70	2.97	0.03
50-59	-0.10	-0.05	-0.05	-0.01	-0.01	0.24	0.28	1.98	-0.03	5.91	80.14	0.20
Standard error	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.86	0.01	1.10	3.23	0.03
60 e oltre	-0.10	P.F.	P.F.	-0.01	-0.01	0.25	0.36	7.61	-0.02	15.96	132.48	0.13
Standard error	0.00			0.00	0.00	0.05	0.05	1.39	0.01	8.06	9.07	0.05
Interaction teacher dummy with gender												
Female	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.
Standard error												
Male	0.05	0.08	0.09	0.08	0.08	-0.01	0.00	-3.37	0.00	-0.34	-9.88	0.04
Standard error	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.45	0.01	0.55	3.09	0.02
Interaction teacher dummy with educational attainment												
up to junior high school	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.	R.G.
Standard error												
High school	-0.04	0.00	0.00	0.00	0.00	-0.07	-0.12	-9.69	0.11	-14.51	-2.59	-0.17
Standard error	0.03					0.06	0.06	2.98	0.07	9.90	19.02	0.08
College or more	-0.02	0.00	0.00	-0.01	-0.01	-0.15	-0.17	-12.65	0.10	-14.79	-9.55	-0.24
Standard error	0.04	0.01	0.01	0.00	0.00	0.05	0.05	2.98	0.07	9.92	19.00	0.07
variable mean value	0.12	0.06	0.07	0.02	0.01	0.32	0.30	36.24	0.05	13.25	126.60	0.54

Source: calculation on Labour Force Survey Data, ISTAT.

(1) The label P.F. means that the effect is not identifiable because all the observations in the group have the same outcome. Models 2,3 and 4 also include dummies for 5 age groups, gender, 3 educational attainment levels, 3 geographical areas and a dummy for working in the public sector. In model 4 the reported effects of the interaction of the teacher dummy refers to the difference between teachers and non-teachers in those groups; the labels R.G. stand for reference groups: therefore the reference group in this models refers female teachers age 29 or less with a junior high school degree. (2) The sample includes the whole workers' population. (3) The sample refers to employees with a fixed term contract.

Table 5

Turnover, mismatch and revealed preference indicator; basic statistics(1)

	Turnover			Mismatch			Teachers' revealed preferences		
	Mean	standard deviation	Regression adjusted mean	Mean	standard deviation	Regression adjusted mean	Mean	standard deviation	Regression adjusted mean
All levels of education	0.494	0.314	0.015	0.136	0.196	0.025	0.014	0.048	0.005
North	0.477	0.324	0.069	0.159	0.218	0.088	0.012	0.051	-0.008
Centre	0.453	0.331	0.106	0.213	0.254	0.156	0.003	0.063	-0.014
South									
	0.472	0.324		0.176	0.231		0.008	0.057	
Italy									
Pre-primary									
North	0.418	0.274	-0.018	0.075	0.110	0.001	0.023	0.041	0.007
Centre	0.360	0.256	-0.005	0.088	0.120	0.034	0.017	0.038	-0.009
South	0.346	0.275	0.050	0.128	0.167	0.096	0.009	0.053	-0.022
Italy	0.371	0.274		0.104	0.145		0.015	0.047	
Primary									
North	0.332	0.143	0.005	0.063	0.060	0.010	0.015	0.052	0.007
Centre	0.330	0.170	0.044	0.101	0.128	0.059	0.011	0.046	-0.008
South	0.310	0.192	0.077	0.143	0.123	0.110	0.003	0.051	-0.017
Italy	0.321	0.173		0.107	0.112		0.008	0.051	
Lower secondary									
North	0.587	0.301	0.068	0.185	0.213	0.060	0.004	0.040	-0.002
Centre	0.608	0.338	0.149	0.237	0.273	0.157	-0.001	0.051	-0.019
South	0.560	0.332	0.162	0.314	0.282	0.224	-0.015	0.064	-0.028
Italy	0.579	0.322		0.251	0.262		-0.005	0.054	
Upper secondary									
North	0.608	0.396	-0.028	0.200	0.273	0.009	0.019	0.058	0.013
Centre	0.585	0.377	0.040	0.194	0.253	0.067	0.022	0.061	0.009
South	0.602	0.394	0.063	0.262	0.338	0.125	0.017	0.080	0.010
Classic Lyceum	0.452	0.260	(baseline category)	0.128	0.166	(baseline category)	0.055	0.057	(baseline category)
Scientific lyceum	0.484	0.316	0.011	0.129	0.175	-0.007	0.044	0.079	-0.007
Artistic lyceum	0.576	0.398	0.083	0.195	0.216	0.061	0.049	0.071	-0.010
Art school	0.559	0.345	0.043	0.196	0.204	0.044	0.022	0.066	-0.023
School for teachers	0.510	0.283	0.025	0.169	0.156	0.019	0.038	0.051	-0.016
Technical school	0.587	0.428	0.108	0.245	0.331	0.113	0.015	0.065	-0.034
Vocational school	0.746	0.381	0.117	0.298	0.351	0.099	-0.006	0.065	-0.047
Italy	0.601	0.392		0.227	0.302		0.019	0.069	

1 In the regressions adjusted column the reference provinces is Torino.

Table 6

Entry in the Italian schools for academic 2004/2005 e 2005/2006

	Tenured teachers in both years that changed school	Newly tenured teachers in year 2005-06 that changed school	Temporary teachers in both years that changed school	Entries of tenured teachers	Entries of temporary teachers	total entry
	1	2	3	4	5	6=1+2+3+4+5
Famele	7.1	2.4	7.1	1.4	4.0	21.9
Males	8.0	1.8	7.0	1.0	4.3	22.0
Total	7.2	2.2	7.0	1.3	4.1	21.9
<29 years	5.3	5.7	27.8	8.5	44.1	91.4
30-39 years	10.1	5.6	19.8	3.9	12.5	51.9
40-49 years	9.0	2.6	7.1	0.9	2.5	22.1
>=60 years	5.1	0.5	1.2	0.3	0.4	7.5
North	6.2	2.5	7.9	1.5	5.0	23.2
Center	7.7	2.3	6.9	1.4	4.5	22.8
South	8.0	2.0	6.3	1.0	3.1	20.5
Total	7.2	2.2	7.0	1.3	4.1	21.9

Table 7

Mobility request of tenured teachers
(number and percentage values)

	Number of requests				Number of request as share of tenured teachers				Number of requests as a share of the total number of teachers (1)			
	North	Center	South	Italy	North	Center	South	Italy	North	Center	South	Italy
Females	32.371	17.672	47.841	97.884	15,4	16,4	18,9	17,2	12,7	14,0	16,6	14,6
Males	8.387	4.405	13.284	26.076	17,2	18,2	19,9	18,7	14,1	15,5	17,2	15,8
<29 years	1.875	558	940	3.373	61,5	66,0	62,8	62,6	16,4	15,3	17,8	16,6
30-39 years	12.662	6.168	15.537	34.367	34,0	37,8	41,5	37,8	18,8	22,5	26,7	22,5
40-49 years	18.086	9.596	27.611	55.293	17,5	21,5	25,4	21,5	15,4	18,4	21,9	18,7
50-59 years	7.897	5.501	16.120	29.518	7,2	8,8	10,8	9,2	7,1	8,6	10,6	9,0
>=60 years	238	254	917	1.409	3,7	3,5	4,0	3,8	3,6	3,4	3,9	3,8
Years of												
Just tenured	14.833	6.324	11.982	33.139	97,1	96,7	97,7	97,2	97,1	96,7	97,7	97,2
1-3	1.264	625	1.567	3.456	21,2	25,6	34,8	26,8	21,2	25,6	34,8	26,8
4-6	6.992	3.697	11.245	21.934	24,5	28,6	36,2	30,2	24,5	28,6	36,2	30,2
7-10	2.201	2.167	8.216	12.584	15,4	18,7	27,0	22,4	15,4	18,7	27,0	22,4
>10	15.459	9.254	28.101	52.814	7,9	9,4	11,6	9,9	7,9	9,4	11,6	9,9
Total(1)	40.758	22.079	61.129	123.966	15,7	16,8	19,1	17,4	12,9	14,3	16,7	14,9

1 The row Total includes those cases in that we are unable to attribute to type or geographical location of the school.

Table 8

Statistical association between turnover, mismatch and revealed with PISA (2003) score in Math

	Model 1			Model 2		Model 3	other control
Turnover	-45.5			-20.2	-33.7	-21.9	
s.e.	7.8			9.2	7.3	9.4	
Mismatch		-215.5		-166		-126.3	No other controls
s.e.		26.6		38.1		55.5	
Revealed preferences			543.8		386.3	143.4	
s.e.			91.4		92.9	132.5	
Turnover	-35.4			-18.3	-28.9	-18.8	
s.e.	6			7.6	6	7.9	
Mismatch		-165		-120.3		-107.9	gender and family background
s.e.		23.9		33.3		47.6	
Revealed preferences			379.2		252.8	47.3	
s.e.			79.8		80.8	112.9	
Turnover	-16.1			-16.1	-15.8	-16.5	
s.e.	3.8			4.5	3.8	4.8	
Mismatch		-33.3		0.3		6	gender and family background, provinces and educational track
s.e.		17.3		20.1		27.5	
Revealed preferences			58.5		11.7	23.4	
s.e.			54.5		54	73.2	
Turnover	-12.2			-11	-12.9	-11.4	gender and family background, provinces and educational track, gender and age composition of the initial stock of teachers, the shares of temporary contracts and of support staff for handicapped pupils, a set of dummies pertaining to the change in the number of students (positive changes, negative changes and negligible changes), a set of dummies relative to the municipality size
s.e.	5.9			6.1	6	6.7	
Mismatch		-23.4		-16.9		-14.1	
s.e.		19.4		19.9		26	
Revealed preferences			24.9		42.5	12.9	
s.e.			61.6		61.6	80.7	

Figure 1

Kernel density estimates of the distribution of graduation marks as percentage of maximum score

(all population)

Graduation marks as percentage of maximum score
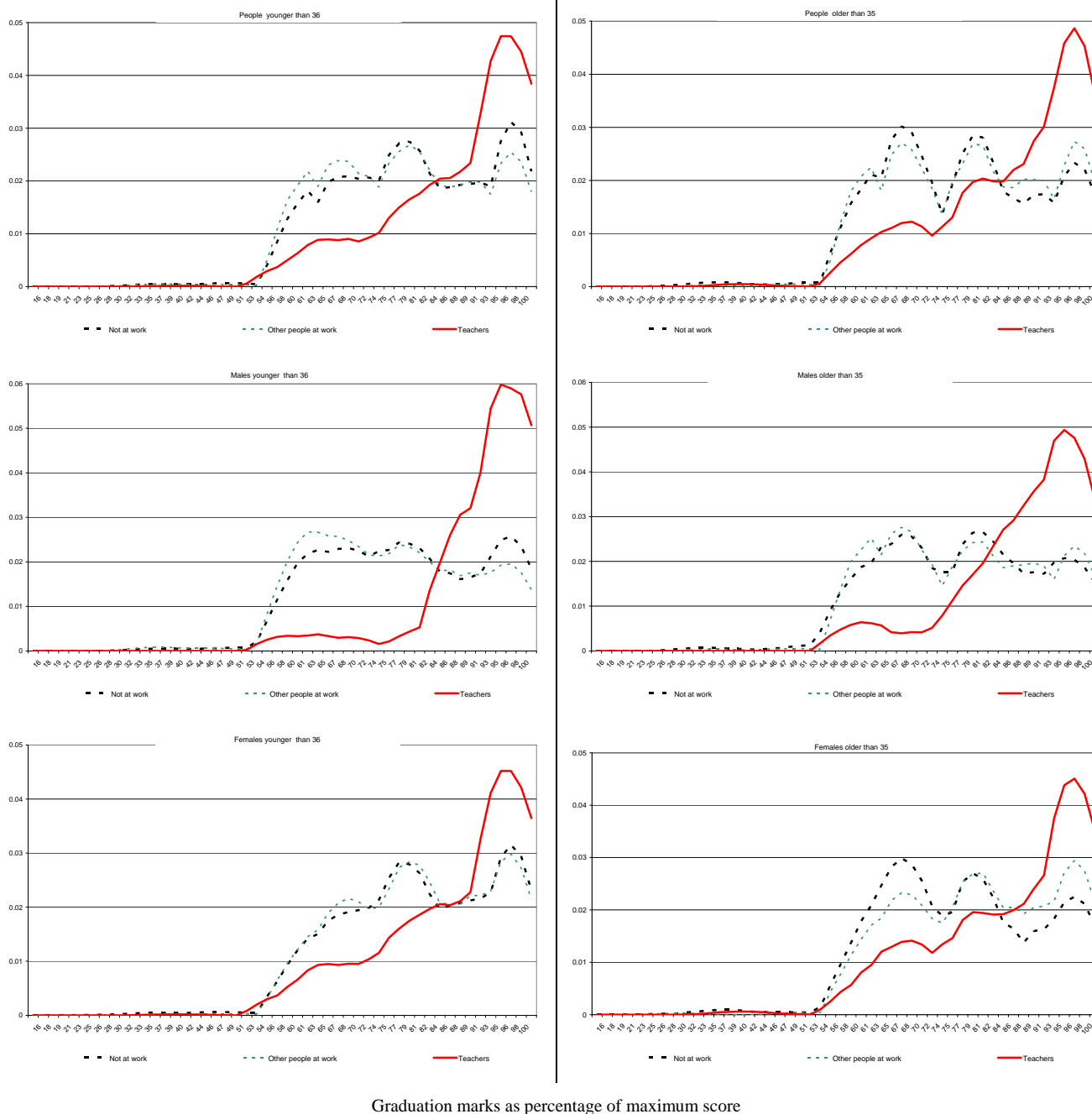
Sources: Bank of Italy, SHIW

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