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Tajikistan Second Programmatic Public Expenditure Review

(In Four Volumes) Volume III: Public Expenditure Tracking Survey (PETS)
Education Sector

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CURRENCY AND EQUIVALENT UNITS

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Currency Unit = Tajikistan Somoni (TJS)

US\$1 = 3.4465

WEIGHTS AND MEASURES

Metric System

ABBREVIATIONS

CSIP	Centralized State Investment Program	PIP	Public Investment Program
CSPro	Census and Survey Processing System	PPER	Programmatic Public Expenditure Review
ECA	Europe and Central Asia	PPS	Probability Proportional to Size
EOP	Executive Office of the President	PRSP	Poverty Reduction Strategy
GDP	Gross Domestic Product	RED/CED	Rayon or the City Education Department
GER	Gross Enrolment Rate		
GOT	Government of Tajikistan	RRS	Republican Subordination
IMF	International Monetary Fund	SOE	State owned Enterprises
IT	Information Technology	SPSS	Statistical Package for the Social Sciences
MDGs	Millennium Development Goals	UN	United Nations
CSIP	Centralized State Investment Program	USD	Unites State Dollar
CSPro	Census and Survey Processing System	VAT	Value Added Tax
ECA	Europe and Central Asia	WB	World Bank
EFA	Public Expenditure and Financial Accountability	UN	United Nations
PCF	Per Capita Financing	USD	Unites State Dollar

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EXECUTIVE SUMMARY

1. Public spending on education in Tajikistan has increased from 2.6 percent of GDP in 2002 to 3.4 percent of GDP in 2006 (Ministry of Finance MTEF 2007) and teachers' salaries have increased considerably. Salaries were raised on average by 25 percent in September 2004 and another average increase of 65% was supposed to be effective in January 2005. In April 2007, a Presidential Order reformed the salaries by reducing the number of supplements and increasing the base salary. The social sectors, including education, have received ongoing support from donors, and further increases in resources are likely. But increased resources to education do not always lead to better outcomes, or even reach schools. Public Expenditure Tracking Surveys have been conducted in many countries in the past decade and in a few cases have exposed large-scale leakage of funds.

2. The good news from the Tajikistan Education PETS is that at the upper tiers of the hierarchy, from the Ministry of Finance (MOF) to the rayons (regions), an effective system of financial accountability is in place, and while there are problems below that, e.g., schools lack budgets and record-keeping is weak at the jamoat (district) and school levels, they are being addressed through the introduction of the per capita financing (PCF) of education. The PCF reform program had been introduced in five pilot rayons as of 2006, when the PETS data collection occurred. It has since been extended to twelve more rayons, and the government has plans to extend it to the whole country. The PETS finds that under the PCF program, unlike under the traditional financing program, schools know their budgets and these are almost always consistent with rayon records, thus completing the financial accountability chain from the MOF to the frontline provider. If the PCF reform is implemented on a national scale as successfully as has been done in the pilot rayons, Tajikistan will have an effective education resource delivery system.

Against this positive message, however, it must be borne in mind that:

- In scaling up the PCF program to a national scale, it may be challenging for Tajikistan to replicate the success that has been achieved in rayons which, by virtue of their status as pilot rayons, have received more attention than it will be possible to devote to the upwards of fifty rayons where the PCF program is yet to be implemented. Though generally positive, PETS findings appear to show some variation among the PCF pilot rayons, and even minor problems observed at this stage could presage larger problems later.
- For the time being, most of the country's schools are under the traditional financing system of local discretion, under which it proved impossible for the PETS to track funds all the way to schools. What happens to non-wage resources, in particular, in the last links of the financing chain, is unclear. Jamoats and to a lesser extent schools keep records on a transaction-by-transaction basis, and audits occur, but an effective financial accountability system that can keep track

of financial flows over time, and enable top-down and bottom-up transparency and effective resource management, is missing.

- There is one important spending category, investment, which the PETS was not designed to study in depth. Nonetheless, PETS findings highlight that investment needs are particularly acute. Moreover, there have recently been large increases in investment budgets.

3. Tajik schools use physical facilities and teachers intensively by the standards of the region. Most schools teach in two shifts, and class sizes are higher than other former Soviet countries and comparable to the levels observed in the OECD. There is probably still some, but not much, room for efficiency gains by consolidating classes in some schools in order to meet non-wage needs such as for teaching supplies and repairs. This appears to be what PCF schools have done upon receiving financial autonomy. At the same time, there are widespread teacher vacancies, especially in rural areas, which sometimes prevent schools from teaching some of the subject-hours mandated by the curriculum, though recruitment was helped by a recent teacher pay raise. Meanwhile, rising pupil populations are putting pressure on the available stock of facilities, and despite the rising investment budget these problems were getting worse as of 2006.

1. INTRODUCTION

1.1. The 2008 JSAN/PRSP states the situation and challenges of Tajikistan's education as follows:

“Tajikistan can achieve universal primary education if the government increases public expenditures in education from 4 percent of GDP in 2005 to an average of 4.2 percent of GDP during 2008-10, and improves the effectiveness of expenditures. The planned adoption of per capita financing of education to give schools more choice of how to use resources, the reform of the teacher load (*stavka*) system, and the introduction of the medium-term budget framework for education will help to improve the impact of available resources. However, more needs to be done to ensure access to both primary and secondary schools for girls and for children from poor and vulnerable groups. Greater effort also has to be made to improve the quality of education at all levels by enhancing pre-service and in-service training, revising the curriculum, and reforming remuneration packages for teachers.” (JSAN/PRSP, 2007, p.8)

1.2. To “improve the effectiveness of expenditures,” it is necessary to understand the present system, its strengths and weaknesses, and the alternatives. Most of the education system—all except for a few rayons which are administered under a new system of per capita financing—is currently under a system of local discretion. By tracking funds through this hierarchy, using a sample survey methodology, the PETS seeks to shed light on how budgets are converted into resources at the school level, and ultimately into educational outcomes.

1.3. There are many applications of the PETS data, only some of which are dealt with in this report, but perhaps the most important is the light the PETS sheds on the relative performance of the traditional local discretion system of school financing and that of the new per capita financing (PCF) system that has been introduced on a pilot basis in selected rayons.

PUBLIC EDUCATION IN TAJIKISTAN

1.4. The education system in Tajikistan is organized into four levels: pre-schools, general education, professional training or specialized secondary education and higher education. Education is compulsory up to grade 9 and free up until grade 11. Access is guaranteed by the Constitution. The distinction between “primary” and “secondary” education which is used in many other countries is not applicable in Tajikistan, where grades 1 to 11 are typically educated in a single school. The Russian/Tajik word for these schools is sometimes translated “secondary school,” though this is misleading because that phrase usually means a school that educates *only* the upper grades. There are also “primary schools” (grades 1-4) and “basic schools” (grades 1-9), generally in areas where there are not enough pupils to support the upper grades. The terms “general school” and “general education” can refer narrowly to “secondary schools” or broadly to all schools, including primary

and basic, that educate pupils in grades 1 to 11. In this report it is used in the latter sense.

EDUCATION BUDGETARY STRUCTURE

1.5. **Although the Ministry of Education is in charge of education policy throughout the country, the lines of financial accountability do not run to the Ministry of Education, but from schools and jamoats up through rayons and oblasts to the Ministry of Finance.** Not all schools are subject to jamoats. While rural schools are supplied with goods, services, and non-teaching staff salaries by jamoats, city and town schools are not under jamoat jurisdiction, but are supplied directly by the rayon. The execution of the education budget is under the responsibility of local governments, with rayon governments in particular enjoying some discretionary power in allocating resources within the education sector. Rayons must execute funds under the “protected” budget lines, including salaries and utilities, within the economic classifications stipulated, but they have discretion to determine the allocation of these among jamoats and schools. There is also a “lump sum” budget allocation for all the non-protected lines, which rayons can allocate on their own discretion both among economic classifications and among jamoats and town schools.

1.6. **Rayons are not, for the most part, financed by the central government, even though the planning and execution of their budgets is part of the national budgeting process.** Instead, revenues are collected at the local level, but some rayons are also “subsidized” with funds from the center. When rayons collect more revenues than anticipated, or when there are unspent funds left over from the previous year, they have more discretion in how to spend these than other funds.

1.7. **Education comprises the majority of local budgets.** According to budget data collected by PETS at the rayon level, the median share of education spending in rayon budgets is 65.0% at the approval stage, 59.7% at the execution stage. Within the education category, a median 89% goes to general schools. As in education systems throughout the world, most of the resources go to salaries and wage related payments. The median share of general schools budgets are dedicated to salaries and social insurance is 93.8% at the approval stage, 90.2% at the execution stage.

1.8. **The provision of non-wage expenditure items is at the discretion of local authorities (hukumats) and schools typically do not know the resources that are budgeted for them.** The per capita budget introduced in 5 districts in 2005 with the support of donors is expected to give more leverage to schools administrators in the use of resources allocated to them. According to this system, the annual financing of a school is calculated from the Rayon or the City Education Department (RED/CED) budget for recurrent expenditure according to the formula set for per-pupil financing schools. It takes into account factors such as the total amount of assignment available for education in the rayon/town budget and the agreed planned statistics of a school.

THE PUBLIC EXPENDITURE TRACKING SURVEY (PETS)

1.9. **Public Expenditure Tracking Surveys are a survey instrument initially developed in Uganda in 1996, later widely used in Africa and to a lesser extent in other regions of the world.** The premise of the PETS methodology is that money officially committed to education or health in formal national budgets does not necessarily reach its intended beneficiaries in schools or hospitals. The PETS seeks to “track” public funds using a sample survey methodology at multiple tiers of the hierarchy. Data is collected as much as possible from *documents*, which are typically more reliable than ordinary respondents’ answers to questions. Using data from multiple levels, PETS analysts can “triangulate” by comparing quantities that ought, in principle, to be the same—for example, a transfer from a rayon to a jamoat should be recorded in rayon and jamoat records as having the same value. One goal, often not attainable, is to produce statistical estimates of the percentage of public education budgets that actually reach schools.

1.10. **In countries of the former Soviet Union, a premise of the early PETS—that record-keeping systems are weak—may not hold.** The Soviet legacy is a strict rather than a casual attitude towards record-keeping. However, the consistency of records is sometimes valued more than their accuracy, and the systems do not tend to empower frontline providers and communities. As a result, even abundant records can fail to produce accountability. PETS can highlight the strengths of the accounting systems, in the face of the reputation for corruption that post-Soviet countries suffer from, while exposing structural weaknesses that inhibit greater accountability.

1.11. **The education Public Expenditure Tracking Survey was implemented by a local firm, Zerkalo, contracted by the World Bank.** A list of the 3,776 schools in the country was compiled. Two rayons had to be excluded because of difficulty of access, resulting in a list of 3,735 schools.¹ Of these, 200 were selected. The sample was stratified so that two subsets of the schools were oversampled: (a) the per capita financing (PCF) pilot rayons, of which 49 were selected, and (b) schools from the sample of the 2004 Education Facility Surveys (EFS), of which 57 were selected, while 15 sample schools turned out to be *both* EFS and PCF schools. The other 109 schools were non-PCF and non-EFS. In each school, 4 teachers were interviewed. When there are less than 4 teachers, all of them were interviewed. The PETS collected information at Rayon and Jamoat level since they are important links in the resources flow chain for the education system. The sample size is presented in Table .

Table 1: Sample size

	non PCF schools	PCF schools	Total	Population used as sample	Population: Total
Rayons	54	5	59	78	76%
Jamoats	110	-	110	495	22%
Schools	151	49	200	3,776	5.2%
Teachers	598	194	792	-	-

¹ Matcho and Murgab rayons were excluded causing the exclusion of 41 schools (with 0.5 percent of all students in the country).

1.12. A system of weights was developed to make the sample representative of the whole population of general schools in Tajikistan. These weights are used in regressions and in the calculation of summary statistics throughout the report.²

ORGANIZATION OF THE REPORT

1.13. **The report proceeds as follows.** Section II deals with staffing issues, including the demographic and professional characteristics of the current teaching staff, principles and patterns of staffing intensity, the supply of teachers and the distribution and consequences of teacher vacancies, patterns in teaching hours and demand for hours by teachers, patterns in class size and evidence about class size decision-making, composition of teacher compensation, and administrative and technical staff. Section III reviews teachers' and principals' perceptions of the major problems the education system faces. Section IV focuses on what seems to be the inadequacy of facilities and investment to meet the needs of the growing pupil population. Section V goes into depth on what the public expenditure tracking exercise shows about the allocation of resources to schools in Tajikistan, including the consistency observed in rayon budgets and down to the jamoat level, the accuracy of PCF school budgets, the weakness of the jamoat-school link in the financing chain, the ways that budget composition shifts during revision and execution, and delays in the payment of salaries. Section VI goes into depth on the PCF program, showing evidence on the institutional feasibility of the program, on how schools are using their autonomy, in particular on the way schools have consolidated classes in order to economize on salaries, the better to supply other school needs, and reports participants' views of the program. Section VII reports on the extra-budgetary resources that schools report receiving. Section VIII uses explores the distribution of problems in the schools using the statistical technique of cluster analysis. Section IX concludes.

² The 95% confidence interval is $\pm 1.96 * S.E.$. This means that there is 95% of chance that the true parameter is the interval $[\mu - 1.96 * S.E.; \mu + 1.96 * S.E.]$ where μ is the estimate.

2. ALLOCATION OF RESOURCES TO SCHOOLS: PUBLIC EXPENDITURE TRACKING

2.1. Aggregated data about budgets, reported by the Ministry of Finance, is widely used in the policy process, and it is important to know if it can be trusted by data users. Aggregated data plays a role in the policy process by allowing donors and policymakers to analyze trends and to calculate unit costs and other summary statistics. But there remains a question of whether aggregated data is accurate. Do the figures appearing in national budgets accurately report what happens to public money on the ground?

2.2. PETS provides highly *disaggregated* data which can be used to check the accuracy of the education financing system, and test whether funds allocated to education are reaching schools. The budgetary data collected by the PETS is uniquely *disaggregated*, having been collected at the rayon and jamoat levels and even, to the extent that this was possible, at the schools. Using this large dataset, a "triangulation" exercise was conducted, whereby the budgets from different levels of the hierarchy were compared. Based on the definitions of budget lines and the rules of the budget process, it was possible, at least from the MOF level down to the incoming budgets at the jamoat level, to anticipate where budget lines from the MOF and a rayon, or a rayon and a jamoat, ought to agree. It was also possible to anticipate many cases where one budget line ought to equal the sum of a group of several other budget lines, the latter being an allocation of the former. A confirmation of these expectations would indicate, at the least, that the budgetary accounting is accurate and consistent, and be highly suggestive of an effective internal control process for public monies in the education sector. A failure to confirm these expectations, by contrast, would cast grave doubt on whether data aggregated at the republican level could be trusted, and on the capacity of the education financing system to channel resources to schools.

2.3. Budget processes in Tajik education appear to be highly accurate down to the jamoat level. It turns out that in almost all cases, the budget data that PETS collected from the Ministry of Finance, from rayons, and to a lesser extent from the *incoming* budgets of jamoats, proved to be accurate and consistent. This PETS finding will presumably come as no surprise to the accountants at all these levels, who seem to be doing their jobs well.

2.4. From the jamoat level down, however, the picture is less clear. The well-ordered system of record-keeping and control of funds which exists, for example, in the rayons, does not exist at the stage of the budget process where goods and services are being distributed, in most cases by jamoats, to particular schools. Although some records are kept in jamoats and schools, jamoat accountants and school *zavkhozy* (resource managers) were not able to reconstruct, on the basis of these records, accounts of what was allocated to and received by schools that agreed with each other. There was an important exception: In the PCF rayons, the jamoat no longer

plays a role, and schools know their own budgets, and can report how they are executed. In PCF rayons the public expenditure tracking exercise was carried all the way down to the school level, and a high degree of consistency was found among budgets at all levels. This is an important advantage of the PCF program over the traditional education financing system.

2.5. In view of the PETS's reputation as an anti-corruption tool, it is worth stressing that many possible forms of corruption were *not* studied by the PETS.

No effort was made to study corruption in the classroom, e.g., bribes for grades; corruption in hiring, e.g., bribes for jobs; corruption in procurement, e.g., overpricing of goods and services and construction by suppliers and contractors; illicit absenteeism with pay by teachers; or paid private tutorship, including the possibility of teachers forcing students to engage in paid tutorship by not teaching the full curriculum in normal class time.

2.6. Per pupil funding ranges from 100 somoni to over 200 somoni per pupil, and was higher in unsubsidized rayons. Per pupil funding can be calculated from the rayon data as collected by the PETS. The main variable affecting per pupil funding is school size: larger schools enjoy economies of scale and can run on less funding per pupil. When this is controlled for, unsubsidized rayons allocated a bit more money per pupil than subsidized rayons. Most but not all variation is driven by school size, and Sogd allocates more money per pupil than Khatlon, despite having slightly larger schools.

2.7. Education budgets are comparatively predictable and subject to few revisions. Education budgets tend to undergo fewer revisions than other budget categories, and are less prone to be overrun in the execution stage. The “protected lines” of salaries and utilities, in particular, are often not executed in full. Leftover funds become “free reserves” that can be transferred to other sectors by the rayon. However, the quantities of money in question are small. Shifts in the composition of the budget process in the course of year suggest that there is some flexibility to adapt to needs that are unexpected or difficult to forecast. At the same time, the protection of salaries and utilities serves to ensure, not with complete success, that funds are available to pay salaries and utility bills. Nonetheless, some delays in salaries and arrears in utility payments are reported.

2.8. Salary delays are a serious problem. Almost half of schools reported salary delays in 2006. Principals often incur personal expense to travel to the rayon to collect the salaries. This helps to explain why salary delays are more frequent in rural than in urban schools.

PATTERNS IN PER PUPIL FUNDING

2.9. Rayons with the largest schools get under 100 somoni per pupil per year, while those with the smallest schools get over 150-200. At the end of the budget formulation process, control numbers are produced which form the basis of budgets. This serves as the budget constraint (not necessarily a “hard” budget constraint since

revisions occur) within which rayons must presumptively operate. At this stage, we can calculate the per pupil level of funding to general schools for each rayon. As shown in Table 2, two factors which affect the per pupil level of funding are (a) the size of the schools, and (b) whether or not the rayon is “subsidized.”

Table 2: Per pupil funding in Tajik general schools: effects of rayon subsidies and school size

Average school size	Somoni per pupil in 2006					
	Unsubsidized rayons	Subsidized rayons	PCF schools	Total schools	Total pupils	Mean pupil-teacher ratio
Under 150 pupils		269	273	1,124	76,531	12.1
150 - 225 pupils		169		410	75,370	14.0
225 - 300 pupils		150	118	332	86,113	15.3
300 - 400 pupils	150	121		380	132,419	17.0
400 - 500 pupils	122	122	145	304	136,218	18.5
500 - 600 pupils	138	93	147	237	129,670	18.5
600 - 700 pupils	132	117	132	205	132,193	19.1
700 - 1000 pupils	119	110	119	395	328,546	20.9
Over 1000 pupils	98		113	389	568,496	23.1
Total				3,776	1,665,556	16.4

NOTE: Blank cells indicate an absence of observations.

2.10. Schools in unsubsidized rayons get more money per pupil, controlling for school size. As Table 2 shows, rayons where the average number of pupils per schools is higher generally receive less money per pupil. This reflects the economies of scale enjoyed by larger schools. *Controlling for school size*, the “unsubsidized” rayons get more money per pupil. If school size is not controlled for, a statistical illusion appears which suggests that the “subsidized” rayons actually get more funds, but this is because they generally have smaller schools with higher per pupil needs. Subsidized rayons are Tajik rayons that receive subventions from the republican government because of special needs and/or a small revenue base. They are generally poorer than the unsubsidized rayons, so it is not surprising that they have more poorly-funded schools.

2.11. The third column of Table 2 shows the average level of per pupil funding in PCF schools. While it appears that PCF schools are somewhat better funded, on a per pupil basis, than the national average, the table should be read with the caveat that the PCF budgets are *school* budgets, whereas the other numbers are derived from *rayon* budgets. Although a similar statistic can be calculated, it may not be directly comparable. The fourth, fifth, and sixth columns are based on data drawn from the sample frame; see next section.)

2.12. Table 3 shows the geographic distribution of per pupil funding. Although there is a visible inverse relationship between per pupil funding and school size, as expected, it is noteworthy that Khatlon schools get less per pupil funding than Sogd schools, even though Khatlon schools are, on average, a bit smaller. This may reflect the comparative affluence of Sogd oblast, or the abundance of teachers in Sogd that

was noted above. Consistent with economies of scale, Dushanbe’s very large schools get the least per pupil funding, while GBAO’s small schools get the most.

Table 3: Funding per pupil in general education, by oblast

Oblast	Average rayon per capita level of funding (somon per pupil per year)	Average school size
Dushanbe	105.31	1,598
RRP	145.01	302
Sogd	133.83	563
Khatlon	114.23	535
Gbao	267.88	215

SMALL SCHOOLS

2.13. It is easier to keep per pupil costs of general education down in larger schools. In smaller schools, it is often impossible to have classes of a pedagogically efficient size. Pupil-teacher ratios are lower, and per pupil costs higher. The number of small schools is increasing. Despite the large increases in enrolment over the last years, average school size has only gone up from 412 in 1991 to 442 in 2006, reflecting the fact that the number of schools has increased significantly in the same period from a total of 3,179 to 3,761 schools in the country.

2.14. Prior to the main PETS data collection, basic data was collected about all general schools in Tajikistan to serve as a sampling frame. This data contains the number of pupils, teachers, and staff, as well as the location of schools and other identifying information, and was used to calculate the statistics in the last three columns of Table 2. These data show that **nearly half of Tajik schools teach under 300 pupils**, though they only teach one-seventh of the pupils (using about one-fifth of the teachers), and **pupil-teacher ratios rise steadily with school size**.

2.15. Consolidating schools could make for a more efficient general education system, and the trend towards building large numbers of small schools pushes in the opposite direction. However, small schools can be built nearer to small communities where many pupils originate, and may make it easier for some pupils to enroll and raise attendance, an important goal that may justify incurring higher costs.

2.16. In the PETS sample there were 83 schools with less than 300 pupils, or just over 40% of the PETS sample. The PETS also collected some indicators on the remoteness of schools’ locations. **Over half (53%) of small schools are more than 0.5 km from the nearest asphalt road.** 34% are over 5 km away from the nearest telephone. Pupils who live in such remote locations might have difficulty getting to another school were school consolidation to be tried.

MOF LOCAL BUDGETS AGREE WITH PETS DATA

2.17. The MOF keeps records of the local budgets which record approved, revised, and executed budgets for the RRP and for the oblasts. These records were made available to the PETS team in the Tajik language. For rayons of oblast

subordination, MOF data cannot be triangulated with PETS data, because PETS data is at the rayon level and MOF data goes down only as far as the oblast.

2.18. For the eleven RRS, a selection of budget lines from the PETS budget data were matched with the corresponding lines in the MOF local budget data. Over 99% of the lines thus compared were found to be in agreement. Given the high degree of accuracy thus observed in the correspondence between MOF and rayon data, it may be presumed that rayons of oblast subordination (ROS) are also financed in an accurate fashion.

RAYON BUDGETS ARE IMPRESSIVELY CONSISTENT

2.19. Rayons are responsible for allocating among agencies and for allocations of non-protected lump sum funds among economic classifications. Rayon financial departments and rayon education departments are responsible for executing a complex budgetary process. Budgetary “control numbers” are received, with “protected” budget lines pre-allocated and “non-protected” lines as a lump sum to be allocated at the rayons’ discretion. Allocations among schools are rayons’ responsibility. The PETS team collected a variety of records at the rayons which allow checking of the accuracy of various breakdowns of the budget related to education. The results are shown in Appendix 1.

2.20. Rayons generally perform and record allocations accurately. Appendix 1 shows that the rayons’ accounting practices are highly accurate when it comes to functional and economic breakdowns of the budget. In every check performed, upwards of 90% of rayons’ budgets were exactly accurate, and in the few cases where discrepancies were observed, these were small.³ More discrepancies are observed when it comes to the allocation of the education budget among jamoats. The rayons where jamoat allocations were exactly accurate were substantial, but were a minority of all rayons. Where discrepancies were observed, some were very small, but the averages are non-negligible.

(a) Inconsistencies in jamoat allocations

2.21. Contrasting with the rest of the rayon records, allocations among jamoats are exactly accurate less than half the time. These discrepancies have a variety of interpretations. The PETS team developed a model of the budget process based on consultations at the republican level and field visits to rayons, oblasts, jamoats and schools, but most rayons were not visited in the design stage and there may be regional variations in budget process to which the questionnaires were not adapted. There may also be errors either in accounting or in resource management. Or discrepancies may reflect inappropriate practices occurring in the allocation of budgets and/or the transmission of funds to jamoats. No firm conclusions can be drawn. Overall, rayons are effective in producing accurate allocations, but the

³ The few errors observed may exist in the rayon budgets or in the PETS data, and the accuracy of both is supported by the paucity of such errors.

possibility of small-scale leakage at the stage of allocation among jamoats cannot be ruled out. (In per capita financing rayons, where funds are transferred directly to schools, the PETS did not collect data on all schools, so it was not possible to perform summations and check whether rayon allocations among schools are accurate.)

(b) Rayons and PCF schools

2.22. PCF schools are in 98% agreement with rayons. Most schools have limited records of the resources they receive from the state budget. Schools which participate in the PCF reform program, however, have very accurate records of their budgets. Among the 49 sample schools which participated in the PCF program and for which budget records from the rayon and the school could be compared, 98% of the budget lines were in exact agreement. Where discrepancies were observed, most often this was due to missing data in the rayon, while in other cases a different number was reported at each level, with the school usually reporting the higher figure.

(c) Rayons and incoming jamoat budgets

2.23. Jamoats' incoming budgets were in 93% agreement with rayons. Jamoats keep records of their incoming budgets, that is, of the amounts allocated to them by the rayon, broken down in advance by economic and functional classification, which they in turn allocate among schools (and other subordinate agencies). These records can be compared with the jamoat budgets as reported by the rayons. Jamoat records reflect with impressive though not perfect accuracy the budgets allocated to them by the rayons. In the PETS sample, 93.3% of the lines in jamoat budgets were in exact agreement with the corresponding lines at the rayon level. For 5.4% of the budget lines, rayons report a quantity while jamoat data is missing, while for 0.6%, the rayon data is missing while jamoats report a quantity. Among the remaining lines, the average discrepancy between the reported figures is 44%. In general, rayons are communicating budgets to jamoats successfully and accurately, though not quite as effectively as in the case of the PCF schools.

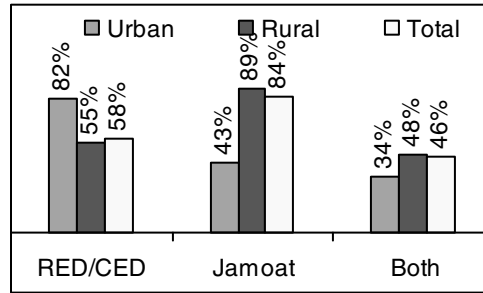
CHANNELING RESOURCES TO SCHOOLS: RAYONS VERSUS JAMOATS

2.24. Resources for non PCF schools are channeled sometimes through rayons and sometimes through jamoats. The Ministry of Finance allocates resources among oblasts and rayons that are under republican subordination (RRS). Oblasts then allocate resources among rayons under their subordination. Generally, rayons pay goods and allocate them directly to schools from urban areas. In rural areas, rayons allocate resources among jamoats which are responsible for allocating among schools.⁴ **In both cases, schools received generally goods and services instead of cash.**

⁴ This financing scheme excludes specialized secondary schools and higher education institutions. They are financed directly by the republic budget.

2.25. Non PCF schools receive goods and services from different sources. In 2006, 58% and 84% of schools have received goods and services from respectively rayon and jamoat authorities and 46% have received it from both. As expected, a majority of schools from urban areas received goods and services from RED/CED while a majority of schools from rural areas received it from Jamoat.

Figure 1: Source of goods and services received in 2006



2.26. While different practices might respond to specific needs and are not necessarily a problem in the chain of resources allocation, they do make the system as a whole more convoluted and are an impediment to transparency.

(a) The problem of information/documentation

2.27. School principals are not always informed of what will be supplied to their school during a year. The first panel of Table 4 reported the proportion of principals who said they have been informed in advance. The information is collected only from schools that received goods and services from rayon or jamoat in 2006. Of schools that declared that RED/CED/RFD (respectively Jamoat) supplied any goods and services to them in 2006, respectively 39% and 53% said that they have been informed in advance.

2.28. In Dushanbe, nearly all the schools (97%) that received something from the RED/CED said that they have been informed in advance. In Sogd, the situation is reversed: only 6% of schools have been informed in advance. Among those that received goods and services from RED/CED, the proportion of principals that reported having been informed is higher in urban than in rural areas.

Table 4: Outside of Dushanbe, few schools know their budgets for the year

	Does Rayon/jamoat inform you what will be supplied to your school during a year?		Did the Rayon/Jamoat provide to your school any documentation	
	RED/CED	jamoat	RED/CED	Jamoat
Dushanbe	96.9		93.2	
RRP	37.9	36.1	78.8	95.8
Sogd	5.8	76.3	87.7	89.0
Khatlon	53.4	38.4	74.1	84.5
Gbao	49.2	94.5	80.2	100.0
Urban	58.1	34.8	74.3	85.8
Rural	36.2	54.4	80.8	89.6
Total	39.2	53.4	79.9	89.4

2.29. Generally, transfers are supported with documentation. The second part of the table reported the proportion of schools that said the transfer was supported with any documentation. Respectively 80% and 89% of deliveries made by RED/CED/RFD (respectively jamoat) are supported with documentation.

(b) Lack of record keeping

2.30. Comparisons of transfers at rayon, jamoat, and school levels shows that source and recipient don't always agree whether a transfer was made or not. It is common that a school reported a transfer and that the jamoat/rayon didn't do so (or vice versa). An example is the provision of chairs to schools: 23 schools declared they received a transfer while only 9 rayons/jamoats declared sending it. Schools and senders agree only on 5 transfers meaning that for 22 transfers, either the school didn't agree, or the sender didn't report it.

2.31. With some exceptions, there is no clear rule among jamoats and rayons about the provision of goods and services to schools. At school level, there is not a unique pattern about who is providing goods and services except for the purchase of technical equipment and inventory: schools reported rayons as being the most frequent providers of equipment such as desks, bookcases, tables and chairs. Jamoats are the most frequent providers of coal and firewood; it might be because jamoats fund schools in the rural areas and schools in urban areas might have recourse to electricity for heating. There are frequently large deviations between the amount of transfer declared by the school and the amount declared by the rayon or jamoat. It is also frequent that schools declared an amount that is higher than the amount declared by the sender.

2.32. It is frequent that school principals do not know the amount of the transfer. All these situations may be justified by the fact that transfers might be insignificant and record keeping is time consuming. However, many reforms are being carried out in the sector. **A first line of reform would be to ensure that schools keep record of transactions that occurred during a year.**

2.33. Goods are usually provided in-kind. It happens that a school gets some cash in order to pay for some goods and services. However, such practices are rare. It generally concerns items such as firewood (10 out of 26 transfers), garbage disposal (10 out of 28 transfers) and to a lesser extent the provision of stationery (17 out of 69 transfers) and economic expenses and equipment (13 out of 72 transfers);

THE WEAK LINK: JAMOATS AND SCHOOLS

2.34. Jamoats do not record allocations among schools. Jamoats have no records of the allocation of goods and services among schools. To keep such records appears not to be defined as part of the jamoat's ordinary responsibilities. The jamoat must keep documents—receipts, waybills, invoices—related to specific transactions. Sometimes these documents are also available in the schools that receive the goods. The jamoats appear to be the weakest link in the accountability chain.

2.35. PETS cannot confirm the accuracy of allocations by jamoats. The lack of records of allocations to schools forced the PETS to abandon one link in the expenditure tracking chain from the beginning. Ideally, PETS would have collected from sample jamoats the **budgets** allocated to *every* school under the jamoat's jurisdiction, and then summed them to find out whether the jamoats had allocated the whole general schools budget to general schools. In the absence of the necessary records, PETS could not collect the data needed to perform this check, and a very simple form of leakage, by which jamoats simply do not allocate education money to schools, perhaps using it for their own needs instead, cannot be ruled out.

2.36. Triangulation of data between jamoats and schools by PETS has to rely on a combination of recall and laborious examination of transaction records. Given the lack of suitable records, there is no straightforward way for the PETS to “triangulate” between jamoats and schools. It is impossible to identify corresponding information in two sets of standardized documents and then compare them. Instead, the PETS asked jamoat accountants to reconstruct such allocations in response to a series of questions designed both to invoke recall and to encourage respondents to exploit whatever documents may be available to get as much accuracy as possible. A similar process was used in schools. The resulting triangulation exercise turns out to exhibit less consistency in the reported information than when data could be gleaned from more standardized documents. It nonetheless provides some evidence about what is happening to resources in the last link from the jamoat to the school.

2.37. Summary statistics show general differences between what jamoats and schools reported about deliveries of non-wage goods. Table 5 compares *summary statistics* of jamoats' reports of what was distributed to schools with summary statistics of schools' reports of what they received. Thus, 47% of jamoats reported delivering stationery to schools (column 2); whereas 33% of schools reported receiving stationery from jamoats (column 3). (It should be borne in mind that not all schools are under jamoat subordination. The sample underlying Table 5 excludes urban schools and per capita financing schools. Also, some schools received stationery from other sources.)

Table 5: Jamoat allocations to schools

(1) Budget category	(2)		(3)		(4)		(5)		(6)		(7)	
	Share of schools for which a jamoat allocation or delivery is reported by:		Share of schools for which a money value of goods and services allocated is reported by:		Average money value (somoni, 2006) where reported, according to:							
	Jamoat	School	Jamoat	School	Jamoat	School	Jamoat	School	Jamoat	School	Jamoat	School
Stationery	47.14%	32.77%	93.71%	82.78%	157	154						
Economic expenditures and inventory	44.55%	39.41%	93.06%	65.48%	307	251						
Sports goods	1.24%	1.24%	100.00%	100.00%	50	50						
Electricity	78.71%	90.75%	39.19%	15.39%	336	303						
Gas	3.49%	2.60%	56.65%	76.00%	871	871						
Heating –Total	65.60%	79.75%	97.05%	55.53%	970	656						
o/w : Coal (including transportation)	53.61%	51.77%	88.12%	43.35%	916	758						
o/w : Wood (including transportation)	31.68%	41.07%	81.54%	82.80%	571	453						
o/w : Other fuel	1.65%	2.61%	100.00%	40.96%	293	332						
Trash pick up	3.84%	4.69%	100.00%	43.94%	208	224						
Toilet cleaning	1.20%	1.56%	100.00%	77.04%	168	185						
Water	10.43%	8.35%	92.16%	21.88%	288	263						
Building repair- Total	16.32%	20.10%	100.00%	80.36%	1,833	1,505						
o/w: Paint	18.76%	18.94%	89.82%	84.38%	250	257						
o/w: Lime	15.92%	16.57%	88.01%	81.21%	145	124						
o/w: Other repair works or construction material [1]	9.08%	10.24%	100.00%	90.61%	576	722						
o/w: Other repair works or construction material [2]	4.94%	5.66%	91.14%	100.00%	1,466	266						
Communication services	13.36%	5.98%	100.00%	49.41%	42	109						
Construction, reconstruction,	0.99%	3.33%	100.00%	68.22%	817	25						
Purchase of technical equipment – Total	0.26%	0.00%	100.00%		2,457							
o/w: Desks		1.36%		100.00%		7,749						
o/w: Bookcases		2.56%		100.00%	240	170						
o/w: Tables		10.96%		100.00%		280						
o/w: Chairs		10.96%		100.00%		140						
other equipment and inventory, indicate other equipment and inventory		0.00%										

2.38. Jamoats report more allocations of stationery, inventory, toilet cleaning and water, while schools report more electricity, heating, paint and lime. By comparing the reports of allocations and deliveries from jamoats and schools, we can see that there are some budget lines for which more deliveries of supplies are reported by jamoats than by schools, and others where the reverse holds, and more deliveries are reported by schools than by jamoats. Thus, jamoats report delivering stationery to

47% of schools, but only 33% of schools report receiving stationery from jamoats. On the other hand, jamoats only report delivering coal to 32% of the schools, while 51% of schools report receiving coal from the jamoats. If anything, the latter case—schools reporting more than jamoats—is more common.

2.39. The money value of goods and services allocated to and received by schools from jamoats is on the same order, although the particular quantities often differ. Table 5 allows us to compare the *average money value* allocated and received for each budget category. For such comparisons, however, it is more instructive to “**triangulate,**” matching specific jamoats and schools. In order to report on the degree of consistency between jamoat and school records, we need to define standards of consistency. For every school, and for each of the budget categories shown in the left-hand column of Table 6, four pieces of information are reported by school and jamoat: (a) whether anything was allocated/delivered, (b) whether the allocation/delivery was in kind or in cash, (c) the quantity, in appropriate units, of what was delivered, and (d) the money value of what was allocated/delivered. Accordingly, the following consistency standards can be defined:

Table 6: Comparing Jamoat- and School-Reported Data: Consistency Standards

Consistency Standard	Was allocation/delivery made/received?	In cash or in kind	Quantity (of appropriate units)	Money value
#1. All fields agree.	Jamoat = school = yes	Jamoat = school	Jamoat = school	Jamoat = school, not missing
#2. Three fields agree, no inconsistency about money	Jamoat = school = yes	Jamoat = school	Jamoat = school	Either jamoat or school is “Don’t know”
#3. Three fields agree, money inconsistent	Jamoat = school = yes	Jamoat = school	Jamoat = school	Two contradictory money vaues reported
#4. Three fields agree; quantity inconsistent	Jamoat = school = yes	Jamoat = school	Jamoat does not equal school	Jamoat = school, not missing
#5. Two fields agree; money and quantity inconsistent	Jamoat = school = yes	Jamoat = school	Jamoat does not equal school	Two contradictory money vaues reported
#6. Both report a delivery but in cash differs	Jamoat = school = yes	Jamoat does not equal school	-	-
#7. One reports a delivery, the other does not				

2.40. Table 7 uses this scale to measure and report the consistency of the budget lines (a budget line here defined as one school, one budget category). As the table shows, many budget lines show a high degree of consistency in all fields, but there

are also many cases where a delivery reported by a school or jamoat is not reported at all by the jamoat or school that is supposed to have delivered or received it.

Table 7: Breakdown of the consistency of jamoat- and school-reported deliveries of goods and services

Consistency standard	Total budget lines, all Tajik general schools (inferred from sample)	Share of budget lines
#1. All fields agree	3,016	19%
#2. Three fields agree; money not reported by one party	4,235	26%
#3. Three fields agree; money value inconsistent	1,338	8%
#4. Three fields agree; quantity inconsistent	144	1%
#5. Two fields agree; money and quantity inconsistent	1,223	8%
#6. Both report delivery; in kind/in cash inconsistent	1,019	6%
#7. One reports a delivery, the other does not	5,231	32%
Total	16,206	100%

2.41. The rate of inconsistencies in reporting on allocations/deliveries varies with the budget category. The frequency of agreement between school and jamoat reports of what was allocated/delivered varied according to the budget category. Usually, schools and jamoats' information about electricity and gas agreed, whereas for stationery, inventory, and most other categories consistency was observed less often than not. The ratio reported in Table 8 is:

Schools which, for each budget category, report an allocation meeting consistency standard #1 or #2

Schools for which jamoat or school reported an allocation/delivery for stated budget category

The apparently high consistency rates for utilities partly reflect the fact that schools rarely report money values for these categories.

Table 8: Jamoat-school consistency, by budget category

	Share of lines for which school and jamoat reports are consistent
Stationery	40%
Economic expenditures and inventory	44%
Sports goods	100%
Electricity	72%
Gas	75%
Heating –Total	57%
o/w : Coal (including transportation)	50%
o/w : Wood (including transportation)	25%
o/w : Other fuel	28%
Trash pick up	13%
Toilet cleaning	20%
Water	31%
Building repair- Total	32%
o/w: Paint	35%
o/w: Lime	61%
o/w: Other repair works or construction material [1]	10%
o/w: Other repair works or construction material [2]	20%
Communication services	49%

Even aside from these systematic discrepancies in records between the jamoats and schools, the PETS cannot confirm the accuracy of the breakdown of the budget among schools by the jamoats, even though we *were* able to perform this check at the rayon level. This was impossible because of the lack of recorded allocations among schools by the jamoats.

2.42. Jamoat accounting processes do not adequately carry financial accountability all the way down to the schools. The main problem with the jamoat is not that they fail to execute their responsibilities, but lies rather in how their responsibilities are defined. Jamoats are not expected to keep track of how funds are allocated among schools. This is harmful both to “top-down” and “bottom-up” transparency; that is, (a) it becomes exorbitantly difficult, or impossible, to track public resources all the way to their final destination in the schools, and (b) schools do not know, at least not formally, what they will get from the jamoat. To know this much, a PETS was not needed. What PETS does is to show that the types of documentation that are available in schools are not able to substitute for the explicit allocations to schools that would make the last stage of the budget process more analogous to the stages above, where the budget process works more effectively.

2.43. Do we need to be able to track funds all the way to schools? Is it necessary for the education financing system to be so organized that it is possible for a PETS to track funds all the way from the MOF to the schools? Probably so, since the purposes of the funds is ultimately to finance schools, and the government, the public, and the donors need to know that that is where the money is really reaching. In that case, institutional changes will be required, at a minimum in record-keeping practices in the jamoat.

SHIFTS IN SECTORAL COMPOSITION OF THE BUDGET DURING REVISION AND EXECUTION

2.44. Funds dedicated to education are usually, though not always, spent within the education sector. If funds are allocated to education in the budget, are they actually spent in the education sector? The answer is a slightly qualified yes, slightly qualified because in the revision and execution stages of the budget process the composition of the budget shifted away from education, at least during the year covered by the PETS data, 2006. Due to the patterns in revision and execution of the budgets, the median share of education in overall rayon budgets fell from 64.4% at the approval stage to 58.9% at the execution stage.

2.45. Upward revisions of the budget are less common in education than in other areas. The approved budget is an authorized plan, but it is subject to revision and may not be executed exactly. The key official budget documents have three columns, representing the “approved,” “revised,” and “executed” numbers. Revisions of the budget occur in the course of the year. The revised budget generally differs from the executed budget for at least some lines, but it is a better predictor⁵ of the

⁵ In a regression of executed budgets against revised budgets, the R-squared is typically about 99%.

latter than the approved budget is. At least in 2006, most budget revisions were upward. For overall spending, the median revision raised the budget by +3.8%. For education, upward revisions are smaller: the median increase was +1.2%. For general schools it was +1.0%.

2.46. Education budgets are rarely overrun and sometimes are left under-executed. Executed *overall* budgets tend to exceed even the upwardly-revised figures. Over 85% of sample rayons executed more than the revised budget, the median overrun being 1.7% of the revised budget. Education budgets, by contrast, tend to be under-executed. 72% spent *less than* the revised budget. The median executed budget was 1.5% less than the revised. For general schools, it was 0.9% less. Under-execution tends to offset upward revisions of the budget, so that the amounts that are ultimately executed are typically slightly less than the amounts originally budgeted (0.6% less for education, 0.5% less for general schools).

2.47. When budgets are not fully executed, the balance is carried forward as “free reserves.” Rayons enjoy more flexibility in how to spend free reserves than with regular budgetary funds. A large part of the rayon budget is “protected,” usable only for a predefined economic classification. And funds cannot generally be reallocated across sectoral **lines** without special permission. The PETS team was not able to establish with confidence what rules if any constrain the execution of free reserves, but free reserves are not subject to the constraints imposed through the control numbers. 37% of the sample rayons reported that they had free reserves at the beginning of 2006, and among those who had them, their median value as a share of the budget was 1.2%. The incentive to accumulate free reserves and thereby increase budget flexibility is offset by the trend of rising budgets, which gives rayons reason to think that present needs are more acute than future ones will be. Also, rayons may fear a “ratchet effect”: if funds are left unused, it will be taken as an indication that needs are less than was thought, and lead to smaller budgets going forward.

2.48. The large share of salaries in the education budget make it relatively easy to forecast, and hard to cut. A major reason for the relative paucity of upward revisions and **budget** overruns in education is that the education budget is comparatively easy to forecast. The salary bill, largely fixed by contract, constitutes most of the budget, and some other educational needs, such as stationery, are fairly predictable. The same factor explains why education budgets are less subject to cuts. In other areas, oblast and MOF officials may make cuts in initial budgets in an effort to constrain spending, recognizing that it may prove necessary to raise budgets again later, or advantageous to do so if revenues turn out to be buoyant. There is little scope to do this in education without cutting into salaries and utilities.

2.49. Non-protected categories are often revised upwards. The composition of the budget shifts in the course of the year not only across sectors, but among the economic categories within the education sector. Protected categories, which comprise most of the budget, are generally a bit less in the execution stage than in the budget formulation stage. Non-protected lines tend to increase, sometimes substantially. Table 23 details how the composition of the budgets for education

overall, and for general schools, changes in the course of the year. Because salaries and social insurance comprise, on average, 87% of rayon education budgets (89% of general schools budgets), even a proportionally small decrease in their share makes room for substantial proportional increases in other categories. For whatever reason, in 2006, utilities budgets were substantially under-executed. For the authorities to overshoot slightly in budgeting for salaries and utilities is a reasonable safeguard against a situation where the rayon would be unable to pay salaries or utility bills.

Table 9: The composition, revision, and execution of rayon education budgets

Budget line	Share of approved budget		Share of executed budget		Median revision (as % of approved budget)		Median execution gap (as % of revised budget)	
	RED	GS	RED	GS	RED	GS	RED	GS
Wages and salaries	69.09	72.14	68.38	71.79	0.00	0.00	-1.52	-0.76
Social and retirement insurance	15.99	16.62	15.70	16.43	0.00	0.00	-1.15	-0.85
Purchase of goods and services	4.62	2.30	5.33	2.77	1.32	0.55	-0.05	-0.38
o/w: Stationery and handouts	0.59	0.44	0.58	0.45	0.00	0.00	-1.17	-0.17
Economic expenditures and inventory	1.10	0.81	1.30	1.00	0.00	0.00	-0.01	0.00
Travel expenses	0.30	0.10	0.31	0.12	0.00	0.00	-0.98	-0.13
Soft inventory and uniforms	0.20	0.10	0.24	0.09	0.00	0.00	-0.15	-0.04
Food	1.62	0.30	1.88	0.35	0.00	0.00	-0.01	-0.02
Fuel and lubricants	0.08	0.03	0.10	0.04	0.00	0.00	-0.06	-1.36
Goods and services not elsewhere classified	0.49	0.36	0.62	0.51	0.00	0.00	0.00	0.00
Utilities	4.51	4.00	3.46	3.01	-1.29	0.00	-6.19	-4.26
o/w: Electricity	1.57	1.36	0.88	0.76	-3.40	0.00	-8.26	-9.30
Heating	1.68	1.61	1.60	1.45	0.00	0.00	-0.80	-0.06
Water	0.16	0.10	0.09	0.06	0.00	0.00	-20.18	-13.57
Trash pickup	0.70	0.52	0.49	0.32	0.00	0.00	-4.81	-1.13
Utility services not elsewhere classified	0.29	0.32	0.24	0.27	0.00	0.00	-1.75	-0.44
Maintenance and repair services	1.96	1.53	4.10	3.34	22.70	10.58	-0.00	-0.00
o/w: Repair of buildings and structures	1.90	1.51	3.94	3.24	17.94	8.93	-0.00	0.00
Fixed assets	0.60	0.38	0.85	0.74	0.00	0.00	-0.38	-0.28
o/w: Equipment, machinery and inventory	0.54	0.36	0.78	0.70	0.00	0.00	-0.48	-0.39

* RED = Rayon Education Department, i.e., education in the rayon as a whole
** GS = General schools budget

2.50. Maintenance and repairs tend to experience the largest upward revisions.

Purchases of goods and services increase slightly in the course of the year. Stationery spending actually decreases slightly, but economic expenses, soft inventory and uniforms, food, fuel, and goods and services “not elsewhere classified” all increase slightly. The largest increases, however, occurred in maintenance and repairs, which more than doubled their share of the budget in the course of 2006. One explanation for this is that the need for some kinds of repairs is typically unforeseen. Schools do not know when windows will be broken or roofs will begin to leak. Also, to the extent that repairs are not urgent, they are like capital investments, and investment

spending is usually more variable than consumption spending. Rather than planning in advance, REDs may see in the course of the year whether they have funds in their budgets, and then use extra funds for repairs if they turn out to be available.

2.51. Rayons appear to enjoy inter-sectoral budgetary flexibility under the old system. The shifts that we observe in the composition of the budget, both across sectors and within the education sector, show that rayons enjoy some flexibility in how they handle their budgets. Flexibility can contribute to efficiency, allowing resources to be matched to needs, while at the same time, the constraints built into the control numbers and the restrictions on reallocation serve to contain the risks associated with discretion. But although the budget process in Tajik education may have struck a good balance between central control and local discretion, it does not necessarily have the optimal decision-making structure.

2.52. Since 1999, public resources allocated to the education as a share of output has been in constant increase: from 2.1% in 1999, the public expenditure in the education sector reaches 3.4% of GDP in 2006 (Ministry of Finance MTEF 2007). According to the 2006 Fiduciary Report, only 9% of resources were managed by the Ministry of Education. The bulk of these resources are managed by local governments and this adds a complexity to the system of resources flows. In this chapter, we analyze the allocation of public resources to schools. In analyzing the provision of goods and services, we will make the distinction between per capita financed schools and non per capita financed schools.

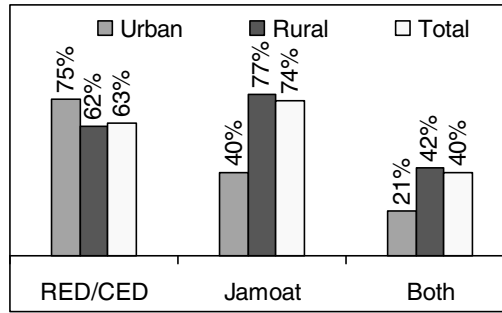
SALARY DELIVERIES AND DELAYS

2.53. Salaries and capital investments are the two major items of expenditures in the education sector. The Education Fiduciary Capacity Assessment (World Bank, 2006) reported that in 2005, 51% of education expenditures were spent on salaries. These resources are managed at various level of local administrations and the objective of this section is to provide an insight on the way salaries are delivered. We then investigate the determinants of delays in salary payments.

(a) Source:

2.54. In general, REDs are responsible for delivering salaries to schools while jamoats are in charge of managing recurrent expenditures. In reality, all kinds of practices are possible. In urban areas, the rayon manages all the resources that go to schools since there is no jamoat. In rural areas, it happens that RED pays the salary for teaching staff and transfers non-teaching staff's salary to the jamoat. In case of very remote schools, the rayon may delegate the payment of salaries to the jamoat.

Figure 2: Sources of salary payment in 2006



2.55. Due to data limitations, this analysis of the sources of salary payments is restricted to non PCF schools. **Many practices are possible as we can see from Figure 2:** 63% of schools have declared that they got their salary from the rayon or the city education department (RED/CED) and 74% from jamoats. By location, a majority of schools from urban areas got salary payments from the rayon while schools from rural areas declared having received them from the rayon (62%) or jamoat (77%). A significant proportion of schools (40%) have received salaries from both sources. This is due to schools from rural areas: only 21% of schools from urban areas have declared so. These results support the possibilities presented before. In the next section, we will investigate whether these practices have an impact on a timely delivery of salaries.

(b) Delays and determinants:

2.56. Delays in salary payments affected half of Tajik schools in 2006. In the non-PCF schools, salaries are generally brought to schools and distributed among teachers by school principals. Usually salaries are delivered on time, but delays are a significant problem. 47% of schools reported that there were salary delays in 2006, and 28% reported that salaries were delayed more than once. The modal delay was one month, and 8% of principals reported delays of three months or more. Within a school, it affects both teaching and technical staff: generally, principals that reported delays for teaching staff are also the ones who reported delays for technical staff.

2.57. There is a clear separation by oblast in terms of delays in salary payments. In Dushanbe and RRP, less than 9% of principals have declared that they experienced delays in 2006. The situation is completely reversed in Sogd and Khatlon where respectively 72% and 56% of principals reported it. Delays are also more frequent among rural schools than urban ones.

Table 10: Delays of salary payment

	Teaching, administrative, auxiliary staff	technical staff
Dushanbe	7.6	7.6
RRP	8.4	8.4
Sogd	72.4	72.0
Khatlon	55.6	53.0
Gbao	0.0	0.0
Urban	31.9	31.4
Rural	49.1	47.9
Total	47.4	46.3

2.58. To understand the relative importance of factors that might cause delays in salary payments, we investigate the determinants of the delay for teaching, administrative and auxiliary staff using a probit model. The dependent variable is a binary variable that captures whether there were occasions of delays in salary payment in 2006 or not. Explanatory variables include oblast, location, and the source of salary payment. We include the number of pupils in the school to control for school size. We also include the distance to the RED/CED: schools that are far from the RED/CED might experience delays because of the travel time needed to reach them. The variable captures whether the school is located at a distance of 5km or less to the RED/CED or not. In table 13, we report the results of the regression using three alternative specifications.

2.59. Regression results (column (3) in Table 11) confirm something that we already know from tabulation: there is strong and statistically significant evidence that schools located in RRP are less likely to experience delays than schools in Khatlon. In Dushanbe, the coefficient is negative but significant only at 10%. Whether the school is close to the RED/CED (within rayon of 5kms) or not does not affect significantly the probability of salary delay. This is not evidence that delays are not affected by distance since the variable captures poorly the distance from the rayon. Whether the schools received salary from RED, jamoat or both does not affect significantly the probability of delays either. This can be related to the fact that salaries are protected.

Table 11: Determinants of delays in salary payment

Teachers data	Principals (non-PCF only)			
	(1)	(2)	(3)	(4)
Constant	0.38 (0.66)	0.93 (0.23)	9.77*** (0.00)	6.83** (0.01)
Teacher's Pedagogical category:				
1st	0.38* (0.04)	0.06 (0.68)		
2nd	0.15 (0.48)	0.22 (0.24)		
General/teach.	0.16 (0.41)	0.00 (0.98)		
School level variables:				
PCF=1	1.79*** (0.00)	1.49*** (0.00)		
Urban=1	0.56* (0.03)	0.46* (0.01)	0.10 (0.86)	0.23 (0.58)
RRP=1	1.34*** (0.00)		1.60*** (0.00)	
Sogd=1	0.68** (0.00)		0.08 (0.87)	
Gbao=1	1.35** (0.01)			
Dushanbe=1			1.40* (0.04)	
(Dist2RED<5km)=1	0.48* (0.02)	0.24 (0.16)	0.01 (0.98)	0.29 (0.46)
Log nb teachers	0.23 (0.52)	1.02*** (0.00)	4.09** (0.00)	2.32 (0.11)
Log nb pupil	0.23 (0.48)	0.84** (0.00)	4.33*** (0.00)	2.63 (0.06)
Pupil-Teacher ratio	0.02* (0.04)	0.02* (0.01)	0.19** (0.00)	0.09 (0.22)
Donor=1	0.43** (0.01)	0.18 (0.19)	0.75* (0.02)	0.48 (0.14)
Salary from RED = 1			0.40 (0.24)	0.35 (0.31)
Salary from jamoat = 1			0.61 (0.09)	0.69* (0.03)
Number of obs	784	784	150	150
F-stat	11.0	8.1	4.8	2.4
Prob > F	0.00	0.00	0.00	0.02
Notes:	P-values in parenthesis.			
	(1) Dushanbe is dropped because Dushanbe = 0 predicts failure perfectly (84 obs not used)			
	(3) Gbao = 1 is dropped because Gbao = 0 predicts failure perfectly (4 obs not used)			

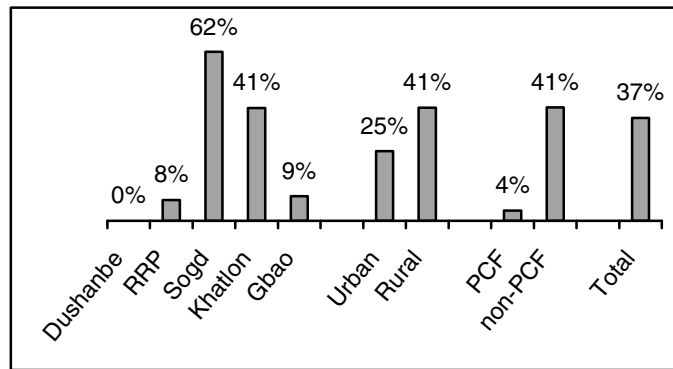
2.60. One reason delays are inconvenient for principals is that school personnel, usually principals but sometimes *zavkhozy* or accountants, often incur personal expense, as well as wasting time, in making the trip to the RED to collect the salaries. The trip is more expensive for those coming from rural areas, who incur an average expense of 10 somoni, not an insignificant fraction of the salary of a Tajik

teacher. If the principal goes to pick up salaries and finds they have been delayed, he may have to go the RED *twice* (or even more) to get the salaries. We can surmise that when delays are a frequent occurrence, principals put off going to collect salaries in order to be give them time to arrive so as not to waste the trip, and this becomes another source of delays for teachers.

2.61. Ultimately, teachers do receive their salaries. Only 3% of sample teachers reported that they had ever received less than their ordinary monthly take-home pay, and there was generally a good reason, such as being in the hospital. There does appear to be a questionable practice of deducting “magazine subscriptions” from teachers’ salaries, which the PETS team encountered during the design phase and is reported occasionally in the PETS data. Only 29% of teachers reported salary delays in 2006.

2.62. Schools under PCF are less likely to experience delays in salary payments. Teachers were asked if there has been occasion in 2006 when their salary was delayed. We present in graph 5 the proportion of teachers who declared an occasion of delay. Results show that the trend is the same as in the results obtained from principals’ declarations: delays are widespread in Sogd and Khatlon and less common in RRP. In Dushanbe, no teacher declared experiencing such delays. Delays in salary payments are also more frequent in rural than in urban areas. **The results from Figure 3 show that very few teachers from PCF schools (4%) reported delays in salary payment.**

Figure 3: Proportions of teachers who declared having experienced delays in salary payment



2.63. The fact that PCF schools experience few salary delays (which participants in the system report as a major reason for the popularity of the program, see Section V) may reflect the differences in the systems of salary delivery. PCF schools apply directly to treasury/ rayon financial department for salary (any intermediates in the process are eliminated) hence the only cause for delay may be a lack of funds in rayon treasury. In the case of non-PCF schools, there may be room for the RED to intervene into the process as a middleman capable of bargaining with schools about their salary request.

2.64. The education financing system in Tajikistan has strengths and weaknesses. Among its strengths are:

- It seems to prevent leakage for the most part, although record-keeping weaknesses limit our ability to ascertain this with confidence.
- The degree of overall budgetary flexibility (though not its structure) seems appropriate.
- Teachers' salaries are delivered in full (though not always on time).

2.65. Against this, the system lacks institutional mechanisms for achieving equity or efficiency, the administrative distinction between protected and non-protected budget lines, combined with the lack of hard budget constraints, encourages too much spending on the former at the expense of the latter, and finally, there is inadequate accountability and transparency. Despite the abundance of records, kept scrupulously by the rayons and to a lesser extent the jamoats, it proved impossible for the PETS to discover how jamoats are allocating goods and services among schools (though we did check whether what jamoats *claimed* to have allocated was, in fact, received, with erratic results). This is indicative of the problems that are probably encountered by auditors. Even more, it suggests the difficulty that schools and civil society actors face in trying to find out to what resources individual schools are due to receive.

3. OTHER SOURCES OF REVENUES

3.1. In addition to the government, international donors and pupils' parents are two other major actors in the education sector: the PEIR (World Bank (2005)) reported that most of investment in the education sector is financed by donors. However, this contribution might be under-reported in this analysis. The reason is that there is generally no budget for schools and the line between budgetary and extra-budgetary spending might be unclear to schools principals. Another reason is that these contributions are included in the Public Investment Program and the distinction again might be unclear. Pupils' parents are also playing an increasing role in supporting schools. In this chapter, we will analyze the frequency and the use of these transfers.

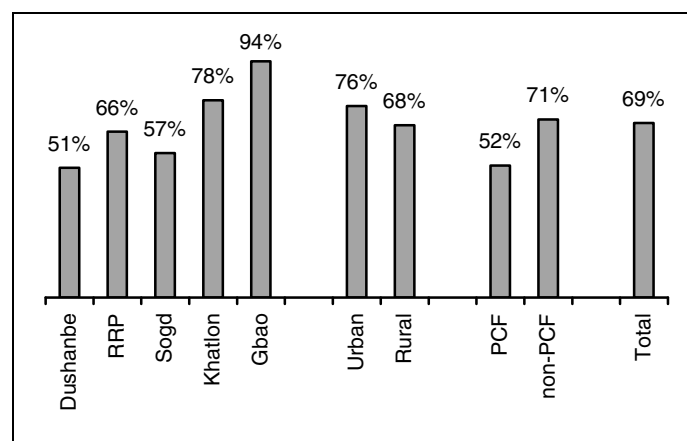
EXTRA-BUDGETARY TRANSFERS

3.2. Extra-budgetary funding refers to any in-kind or cash transfer received from any source and that was not taken into account in the budget.

(a) Frequency and source of the transfers

3.3. Extra-budgetary transfers are frequent especially among non-PCF schools. According to principals' declarations, two-thirds of schools have received at least one of such transfer in 2006 (Figure 4). Schools under per capita financing system generally receive the resources that are budgeted for them and are less in need of additional resources than schools under general financing scheme. This might explain why only 52% of PCF schools received such a transfer compared to 71% of schools under general financing scheme. Transfers are less frequent in Dushanbe and Sogd than in the other oblasts.

Figure 4: Proportion of schools that have received an extra-budgetary funding



3.4. International donors and pupils' parents are the most frequent sources of these transfers. In Table 12, we report by source and location, the proportion of schools that received an extra-budgetary transfer. The most frequent providers are

pupils' parents and international donors: respectively 32% and 22% of schools reported that they have received a transfer from these sources. Transfers from pupils' parents are more frequent in urban areas than in rural areas. This might be related to a higher ability to pay in urban areas. In rural areas, one would expect schools to be supported by collective farming. However, the data do not show that a higher proportion of rural schools received a transfer from collective farming or state owned enterprises.⁶

Table 12: Proportion of schools that received an extra-budgetary transfer

	Urban	Rural	Total
Government	10.3%	7.5%	7.8%
Private companies	1.8%	0.1%	0.3%
Parents of pupils	41.6%	30.6%	31.9%
Private sponsors/Farmers	2.7%	9.6%	8.8%
School (Income Generating Activity)	2.1%	3.1%	3.0%
International Donor	23.4%	22.0%	22.1%
NGOs	0.0%	6.5%	5.7%
Collective farming / State Owned Enter.	21.0%	19.8%	19.9%

3.5. Government source refers to central government and local administrations units such oblast, rayon and jamoat: 8% of schools received at least one transfer from one of these sources.

(b) Characterization of the transfers:

3.6. Schools received on average 1.3 transfers in 2006 and the number of transfers ranges from 0 to 11 transfers. In order to analyze the nature and the use of these transfers, we consider in this sub-section each transfer as a single observation. The analysis is based on a sample of 281 occurrences of transfers.

(i) Nature of the transfer:

3.7. Transfers are either in cash or in-kind depending on the donor. Extra-budgetary from central or local governments are generally in-kind. A majority of transfers from international donors or NGO are in-kind. Cash transfers are more frequent among transfers made by pupils' parents (79% of transfers) or private sponsors and farmers (64%). The distribution of extra-budgetary transfers by type is shown in Table 13.

⁶ It is possible that rural schools received a transfer from collective farming while urban schools received it from State owned enterprises. However, data does not allow us to separate these two sources.

Table 13: By source: nature of the extra-budgetary transfer

	Cash	Goods	Services	Total
Government		94.7%	5.3%	100.0%
Private companies	38.8%	47.4%	13.8%	100.0%
Pupils' parents	78.7%	18.1%	3.2%	100.0%
Private sponsors/farmers	64.0%	36.0%		100.0%
School activities	66.5%	33.5%		100.0%
International Donor	28.6%	68.7%	2.7%	100.0%
NGO	24.8%	54.0%	21.2%	100.0%
Collective farming/SOE	58.6%	41.2%	0.2%	100.0%
Others		86.6%	13.4%	100.0%
Total	49.8%	46.1%	4.1%	100.0%

(ii) What is the transfer used for?

3.8. The analysis of the transfers by the user shows that the quality of schools' infrastructure is a major concern for the local and donor community. **Nearly a majority of transfers refer to school renovation or the provision of construction materials.** These two items account for 49.1% of the transfers. Another common object of extra-budgetary transfers is the provision of food products to schools. In table 14, we present by source, the use of the transfers. Government transfers are about the provision of tables, desks chairs, computers and printers.

Transfers from pupils' parents are generally for school renovation (53%) or the provision of construction materials (25%).

International donors' transfers concerned generally the supply of food products to schools (57% of transfers) and to a lesser extent schools' renovation (19%).

Revenues from income generating activities are generally used for school renovation (57%) or purchasing materials related to heating (coal, wood, etc.)

3.9. We also present in Table 15, by item the providers: Computers and printers are provided generally by government units, NGO or collective farming/SOE.

Construction materials are provided generally by collective farming/SOE, with pupils' parents the most frequent providers of construction materials (respectively 54% and 38% of transfers).

Nearly all the transfers related to food products or the constructions of toilets are provided by international donors: respectively 89% and 82% of transfers are provided by them.

Pupils' parents are by far the most frequent actor in schools' renovations. They provided 50% of the transfers.

Table 14: By source: what is the transfer used for?

	Government	Private companies	Pupils' parents	Private sponsors/farmers	Income from school activities	International Donor	NGO	Collective farming/SOE	Others	Total
Boarding						1.0	1.5			0.4
clothing/sports goods		13.3		1.7		4.0		6.7		2.4
Computer/printer	17.9		0.6	7.1		1.0	11.4	3.8		4.0
construction material		34.2	25.3	5.9		1.5	6.6	52.7		18.9
food products			2.0			56.6	4.1	4.1		14.9
Furniture	3.5		5.8			3.5	5.9	0.4		3.3
Heating	7.2		7.4	6.2	21.5	0.5	2.6	5.4		5.0
school activities		25.6		1					57.2	2.5
school renovation	5.3	27.0	53.0	40.4	57.3	18.8	26.2	17.5	13.4	30.2
Stationery			0.6	21.0	7.9	0.3	2.6	1.9		2.5
tables/desks/chairs	32.1					3.1	39.0	4.8		7.3
Textbooks	10.6					2.9		2.2	29.4	2.8
Toilets					8.5	4.0				1.1
Musical instruments,...	21.8			7.7		0.7				2.5
Others	1.7		5.4		4.9	2.2		0.5		2.4
Total	100	100	100	100	100	100	100	100	100	100

Table 15: By item: who are the major providers?

	Government	Private companies	Pupils' parents	Private sponsors/farmers	Income from school activities	International Donor	NGO	Collective farming/SOE	Others	Total
Boarding						67.4	32.6			100
clothing/sports goods		1.6		5.2		38.8		54.4		100
Computer	36.2		4.6	12.8		5.8	22.2	18.5		100
construction material		0.5	38.4	2.3		1.8	2.7	54.3		100
food products			3.7			88.7	2.2	5.4		100
Furniture	8.5		50.5			24.8	14.1	2.2		100
Heating	11.5		42.2	8.9	10.3	2.4	4.0	20.8		100
school activities		3.0		29.5					67.5	100
school renovation	1.4	0.3	50.3	9.7	4.6	14.5	6.7	11.3	1.3	100
Stationery			6.9	60.6	7.6	2.3	8.1	14.6		100
tables/desks/chairs	35.5					1	41.6	12.9		100
Textbooks	30.3					24.1		15.3	30.3	100
Toilets					17.9	82.1				100
Musical instruments,...	70.9			22.3		6.8				100
Others	5.8		64.3		4.9	21.1		3.9		100
Total	8.0	0.3	28.6	7.2	2.4	23.3	7.7	19.4	2.9	100

(c) Amount of the transfer

3.10. There are two outliers. A school in Dushanbe received services valued at 2,500,000 somoni from government and a school in a rural area in Khatlon received 1,200,000 somoni from an NGO. These observations are excluded from the following analysis which concerns only schools that received at least one transfer and were able to evaluate the amount. We report in Table 16 the average transfer per pupil received, which is 8 somoni per pupil.⁷

Table 16: Extra-budgetary transfer per pupil

	Urban		Rural		Total
Dushanbe	17.6	(10.4)			17.6 (10.4)
RRP	117.5	(57.5)	13.4	(6)	24.4 (9.1)
Sogd	10.4	(8.9)	2.9	(1)	3.8 (1.4)
Khatlon	16.3	(14.7)	1.9	(0.8)	3 (1.4)
Gbao	0	(0)	1.2	(0.7)	1.1 (0.6)
Total	33.7	(13.2)	4.7	(1.5)	8.2 (2.2)

3.11. There is a great variation among oblasts. The average transfer per pupil is higher in Dushanbe and RRP than in the other oblasts: schools in Dushanbe receive on average 18 somoni per pupil while schools in Khatlon receive only 3 somoni. There is also a variation in the amount received across location: urban schools get on average 34 somoni per pupil while rural schools get on average 5 somoni per pupil.

(d) Determinants of extra-budgetary transfers:

3.12. To understand the motivations of extra-budgetary transfers, we investigate the determinants of the recipient of this funding. The dependent variable is binary and captures whether the school has received at least one extra-budgetary transfer or not. Explanatory variables include a dummy variable for PCF. We control for the school size with the number of pupils and the pupil-teacher ratio. School location is captured by a dummy variable for schools located in urban areas other than Dushanbe and a dummy variable capturing whether the school is located at 5 kms from the RED/CED. To capture a possible crowding out effect of the receipt of donor funding on the receipt of public resources, we introduce a variable related to whether the school has received goods and services from the rayon or jamoat or not.

⁷ If we exclude from the sample schools with zero transfer, the mean reaches 17 somoni per pupil (table not reported).

Table 17: Determinants of extra-budgetary funding

Sample:	Without per capita consumption		With per capita consumption	
	full	non-PCF	full	non-PCF
	(1)	(2)	(3)	(4)
Constant	1.252* (0.022)	2.315* (0.032)	-0.861 (0.447)	0.372 (0.808)
Per capita consumption			0.014 (0.186)	0.019 (0.066)
PCF	-0.865** (0.006)	-0.787 (0.134)		
Nb of pupils	0.001 (0.107)	0.001 (0.120)	0.001 (0.131)	0.001* (0.041)
Pupil-Teacher ratio	-0.037 (0.171)	-0.042 (0.147)	0.001 (0.990)	-0.012 (0.798)
Other urban=1 (Dist2RED<5kms)	0.621* (0.041)	1.417* (0.014)	0.539 (0.130)	0.839 (0.180)
Dushanbe=1	-1.053* (0.036)	-0.350 (0.593)	-1.790 (0.062)	-1.814 (0.069)
RRP=1	-0.377 (0.345)	-0.461 (0.337)	0.177 (0.791)	-0.170 (0.805)
Sogd=1	-0.938* (0.047)	-1.095* (0.026)	-0.405 (0.470)	-0.734 (0.215)
Gbao=1	0.577 (0.320)		0.751 (0.367)	
Goods and services:				
- from RED		0.048 (0.911)		-0.119 (0.805)
- from jamoat	(0.014)	-0.931* (0.010)		-1.059**
Obs	198	150	141	117
P-value	0.01	0.04	0.06	0.06
(P-values in parenthesis)				

3.13. The results of the probit estimation are reported in table 24. In column (1) the observations include PCF and non-PCF schools. **Whether the school is under PCF affects negatively its probability of receiving a donation.** The result is statistically significant at the 1 percent level. A possible explanation is that the provision of public resources to PCF schools is more efficient and there is less need for extra-budgetary resources. The probability of receiving an extra-budgetary transfer is negatively associated with Dushanbe and to a weak extent, with Sogd. **Schools in the other urban areas (excluding Dushanbe) have a higher probability of receiving a transfer than schools in rural areas or Dushanbe.**

3.14. In column (2), we report a probit regression for non-PCF schools only. This allows us to include additional variables capturing whether the schools received goods and services from the rayon or jamoat in 2006. **Schools that have been supplied with goods and services by the jamoat have a lower probability of**

receiving an extra-budgetary transfer. However, we cannot interpret this result as evidence that extra-budgetary transfers are a substitute to transfers from jamoats. The reason is that not all the schools are supposed to receive goods and services from jamoats.

INCOME GENERATING ACTIVITIES

3.15. Although authorized by a presidential decree, few school principals reported that their schools are engaged in income generating activities. Only 33% of schools are engaged in gardening or plant growing. In fact, land related activities are limited by the availability of land. When land is available, schools generally practice plant growing or gardening. 38% possess a subsidiary land site and:

87% of these schools practice these activities;

59% of them collected harvest in 2005. The harvest collected was sold for cash or kept for the school's use (82%);

Other activities are rare: only two schools in Sogd are involved in livestock farming and 4 rent some of their property or land.

3.16. Another activity that may help schools getting extra resources is for-pay classes. But only 6% of schools reported giving for-pay classes. **However, a majority of principals (52%) said that they intend to establish an income-generating activity in their school. The most frequently cited activities are paid classes and land lease.** If these plans are fulfilled, income-generating activities will be a more important part of school revenues in the future.

TEXTBOOK RENTAL PROGRAM

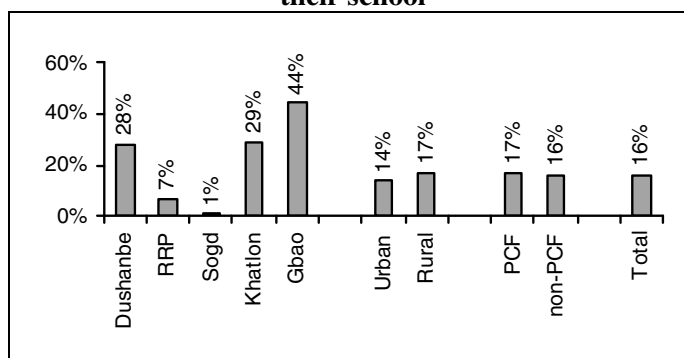
3.17. The textbook rental program was introduced under a donor-funded project and expanded in 2001 to the rest of the country. With this program, textbooks are supplied to the school by the rayon or the city education department. The school rents textbooks to pupils and generally collects a fee. At the end of the year textbooks are collected and rented out to next year's pupils. The school should recover cost of each textbook with 3 years rental fees. After recovery of cost, textbooks become the property of the school and can be rented at another rate.

3.18. Almost all the schools (98%) collect rent for use of the books and keep related documentation (94%). This is a higher proportion of schools than receive any other educational input, which casts a favorable light on the effectiveness of user fees as a distribution mechanism.

3.19. However, textbooks are in general insufficient. Only 16% of principals esteemed that there are enough textbooks for their schools. There is variation across oblasts, Dushanbe and Khatlon having higher proportions than RRP and Sogd. With hardly 1%, Sogd is the oblast with the lowest proportion of schools having enough textbooks. The insufficiency of textbooks is odd because it does not seem that

textbooks needs should be particularly hard to project. Unfortunately, PETS does not have enough information to determine whether textbook shortages reflect rationing by rayons or schools in response to incentives arising from the need to collect rental fees on the textbooks. (For example, when textbooks are sufficient, are schools under pressure to provide them to pupils who are unable to pay, which in turn undermines their ability to collect rental fees from pupils who can pay?)

Figure 5: Proportion of school principals who reported that there is enough textbook in their school



3.20. Schools principals reported on average that 62% of school needs in textbooks are covered. For schools that reported having an insufficient number of textbooks, principals were asked to estimate by what percentage is their school provided with textbooks. Results are reported in Figure 5. The coverage among these schools is 62%, higher in Dushanbe and urban areas than in the other oblast. The coverage is also higher among PCF schools than among non-PCF schools.

3.21. Generally, textbooks are insufficient because they are not published or to a lesser extent, because the quantity received from the RED/CED was insufficient. The survey data is rich enough and allows an analysis by topic, grade, and reason for which the school is lacking textbooks. In Table 18 we report by subject the proportion of schools that reported having an insufficient number of textbooks for at least one grade. We also report the reason for the shortage or lack of textbooks.

3.22. Nearly 3 out of 4 schools (73%) reported having an insufficient number of textbooks in the following subjects: *Tajik/Russian language in classes of schools with other languages of instruction*. The other major subjects are Tajik/Russian/Uzbek/literature (49% of schools), physics (48%), mathematics (47%) and chemistry (42%). The major reason across all subjects is that textbooks are not published. For the subjects listed above, the proportion of principals that justified the insufficient number of textbooks ranges from 63% to 72%. Sometimes, textbooks are insufficient because the quantity received from RED/CED wasn't enough.

3.23. The amount collected is on average 3.2 somoni per pupil as reported in Table 19. All these amounts are not collected from pupils' parents: 39% of principals reported that the amount wasn't fully collected from pupils' parents. There is a great disparity in the amount collected: it ranges from 0.20 to 15.98 somoni per pupil.

Table 18: Those that reported insufficient number of textbooks:

Topic	% of schools with insufficient number of textbooks	Reason for insufficient textbook:				
		not published	not returned from last year	Insufficient amount received from RED/CED	not translated into Uzbek/Kirghiz/other language	Other
Tajik/Russian language in classes with other language of instructions	72.0	72.9	0.7	21.6	2.2	2.6
Tajik/Russian/Uzbek literature	48.5	79.1	2.3	10.9	6.2	1.6
Physics	47.5	69.3	0.9	17.5	10.5	1.8
Math / Algebra / Geometry	47.0	73.9	3.4	16.0	5.0	1.7
Chemistry	42.0	63.4	1.1	26.9	7.5	1.1
Foreign languages (English / German / Farsi / Arabian)	35.5	69.5	2.4	22.0	2.4	3.7
Biology/Ecology/Botanic	35.0	69.7	1.3	18.4	9.2	1.3
Modern history/History of Tajik people/ History of religion	31.5	58.0		21.7	18.8	1.4
Introduction in basics of State and Law	23.5	86.0	1.8	7.0	5.3	
Geography	17.5	50.0		21.1	21.1	7.9
Human rights	14.0	82.1		14.3	3.6	
Alphabet and reading	7.5	81.3	6.3	12.5		
Primary military training	7.5	73.3		13.3		13.3
IT	6.5	61.5		30.8	7.7	
Classes thought in primary school	5.5	72.7		18.2	9.1	
Natural history	4.5	40.0	20.0	30.0	10.0	
Drawing/sketching	4.0	100.0				
Singing and music	3.5	85.7				14.3
Drawing	2.0	50.0		25.0	25.0	
Other	2.0	5.9		5.9	88.2	
Labor/technology	1.5	100.0				
Physical training	0.5	100.0				

Table 19: Average per pupil rent collected for the use of textbooks

Oblast	Mean (S.E.)	min	max
Dushanbe	3.4 (0.5)	0.68	10.23
RRP	4 (1.0)	0.41	15.98
Sogd	2.9 (0.3)	0.20	6.72
Khatlon	2.6 (0.5)	0.30	8.06
Gbao	3.5 (0.6)	2.76	4.77
Urban	3.3 (0.4)	0.20	11.61
Rural	3.2 (0.4)	0.30	15.98
PCF	5.7 (2.2)	0.30	15.98
non-PCF	3 (0.3)	0.20	11.12
Total	3.2 (0.4)	0.20	15.98

4. HUMAN RESOURCES FOR EDUCATION

4.1. Since salaries and social payments constitute upwards of 90% of the general schools budget, an analysis of resource use in schools must begin with human resources and compensation. Schools' primary obligation is to teach the curriculum to pupils. To fulfill this obligation requires a teaching staff of adequate size with a certain mix of qualifications. Efficiency depends on keeping staffing intensity high enough, i.e., on keeping class sizes sufficiently large, which requires some combination of relatively high pupil-teacher ratios and/or relatively low teacher workloads. There will, however, be pressure to lower staffing intensity, coming (a) from schools and/or principals, who are likely to prefer smaller class sizes since they are not responsible for keeping within the budget constraints faced by jamoats and rayons, and (b) from teachers, who on average tend to want more hours, in order to earn more, and may also want smaller classes.

4.2. To prevent schools from making class sizes too small, and thus reducing budgetary efficiency, decisions on class splitting are generally reserved for rayon personnel. However, rayon personnel do not have the best information about the real acuteness of schools' needs to split classes, and schools do not have incentives to give them unbiased information. A class splitting *rule* – in Tajikistan, the modal class splitting rule sets the class size ceiling in grades 1 to 4 at 25, and for grades 5 to 11 at 30 – gives rayons an objective basis for making decisions. In fact, we do not observe that class splitting rules are precisely followed, and there are “too few” classes in some schools and rayons, and “too many” in others. If the modal class splitting rule were followed precisely, there would be slightly fewer classes, i.e., lower staffing intensity and greater efficiency than at present. The experience of the PCF rayons, however, indicates that the modal class splitting rule probably makes class sizes inefficiently small. It is not clear whether this is due mainly to policy or whether classroom capacity constraints are a limiting factor.

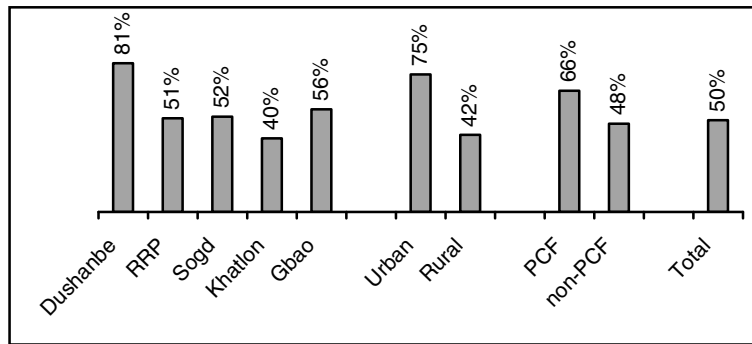
4.3. Teachers' salaries are regulated at the republican level, and hourly wages are fixed by pay grade, with rewards for experience, but otherwise vary little across the country. At the time of the survey, in addition to salaries and social insurance, teachers receive a variety of supplements, and these payments show marked inter-regional variation. However, a reform suppressed many of the supplements in April 2007, so PETS data, which pertain to 2006, may already be obsolete in this respect.

CHARACTERISTICS OF THE TEACHING STAFF

(a) Gender:

4.4. Although men and women are equally represented in the teaching staff, there is a great variation across oblast. In each school that was visited during the survey, the PETS team interviewed four teachers selected randomly. We present in Figure 6 the proportion of women in the teaching staff. Women are over-represented in all the oblast except Khatlon. The proportion of women in the teaching staff is especially high in Dushanbe (81%). It is also higher in urban areas than in rural areas.

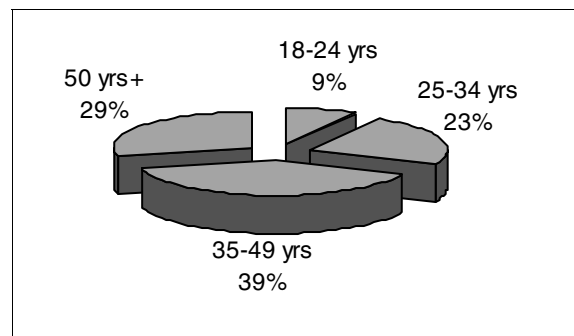
Figure 6: Percentage of women in the teaching staff



(b) Age:

4.5. The average age among teachers is 42 years. Though lower than the average age of teachers in some countries, this age may be regarded as the appropriate mid-point of a career if a person’s working life lasts from the early 20s to the mid-60s. The distribution by age category (graphic 3) shows that 29% of teachers are 50 years old or more and 9% are less than 24. The latter include many young graduates fulfilling conditions of previous scholarships for their own pedagogical education. Thus, there is a high number of students enrolled in pedagogical colleges and universities. The Stavka Note (Steiner-Khamsi (2007)) reported that typically, half of graduates with a pedagogical degree enter the profession. Those are generally students that benefited from government scholarship and who are required to spend at least two years in the profession. But a majority of them quits the profession after these two years. The education system will probably need to retain more of these trained teachers, or attract them back into the profession, if it is to cope with the teacher vacancy problem described below, and the impending steep demographic growth in pupil populations in the years to come.

Figure 7: Distribution of teachers by age category

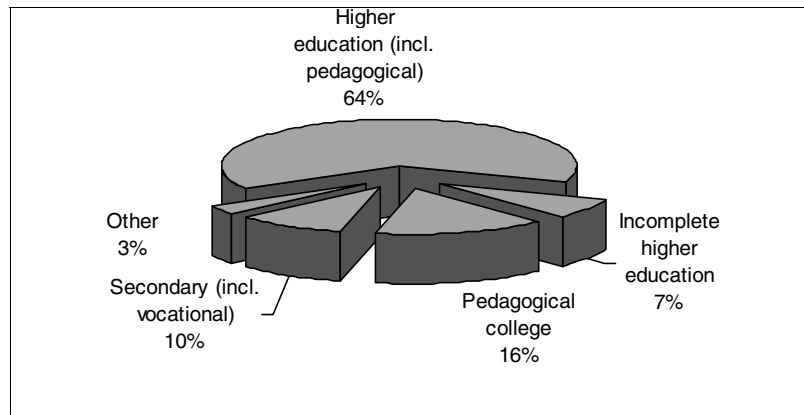


(c) Education level:

4.6. The proportion of teachers with a higher education is low compared to 1991. The Education Sector Review (World Bank, 2002) reported that the percentage of teachers with a higher education level was 77% in 1991. Results from the PETS show that two-third (64%) of teachers has a higher education in 2007 (including higher pedagogical education). This decline probably reflects both supply-side factors—fewer

people obtaining higher education—and demand-side factors—low salaries. Though a cause for concern, it should not be assumed that a lower concentration of formal qualifications lowers the quality of pedagogy, which depends on many factors.

Figure 8: Distribution of teachers by education level



4.7. PETS confirms about 7.3% of teachers are unqualified. Official statistics reported that there are 7.4% of teachers without a diploma or a teaching certificate. PETS results show that there are 7.3% of teachers with incomplete higher or pedagogical higher degree and 2.6% with incomplete pedagogical college. However, we cannot conclude that these teachers do not hold any diploma or teaching certificate.

(d) Pedagogical experience:

4.8. Teachers have on average 18 years of pedagogical experience. Teachers are classified into four pedagogical categories: high pedagogical category, 1st and second pedagogical category, and Teacher/General. In Table 20, we report the distribution of teachers by pedagogical category. At national level, 79% of teachers have the second pedagogical category or higher. In Sogd, a majority of teachers (53.2%) have a high pedagogical category while the proportion is about 25% in Khatlon, Gbao and 24% in RRP. In Khatlon, one-third of teachers (33%) have the lowest pedagogical category (Teacher/General or other) compared to 21% at national level.

Table 20: Distribution of teachers by pedagogical category

	Category:			Teacher/ General/other	Total
	High	1st	2nd		
Dushanbe	35.6	24.4	18.6	21.4	100.0
RRP	23.8	34.7	20.8	20.7	100.0
Sogd	53.2	23.3	11.7	11.9	100.0
Khatlon	25.1	22.9	18.7	33.3	100.0
Gbao	24.5	27.8	37.5	10.3	100.0
Urban	36.4	30.0	15.3	18.3	100.0
Rural	35.6	24.7	18.1	21.7	100.0
PCF	34.6	22.7	17.9	24.8	100.0
non-PCF	35.9	26.3	17.4	20.4	100.0
Total	35.8	25.9	17.5	20.9	100.0

STAFFING INTENSITY

4.9. For budgetary purposes, a critical variable is *staffing intensity*, the quantity of human resource “inputs” needed per pupil-hour of a school’s “output.” For pedagogical purposes, low staffing intensity—more teachers, and other staff, per pupil—are often regarded as advantageous. But low staffing intensity is expensive, and international research suggests that its pedagogical benefits may be small or nil. To keep staffing intensity high is the cheaper, and probably the more efficient,⁸ way to educate pupils.

4.10. **What is the best measure of staffing intensity?** The pupil-teacher ratio is a commonly used indicator of staffing intensity, but it is not a good measure in post-Soviet systems where there is a good deal of variation in the number of hours that teachers work. What ultimately matters, for both budgetary and pedagogical purposes (at least, provided pay is proportional to hours), is the number of pupils in a classroom—class size. Numbers of teachers and pupils are more often available than class sizes, so the pupil-teacher ratio is easier to calculate and compare across countries, but may be of limited relevance if average teaching hours varies systematically. Fortunately, the PETS data is rich enough for us to study class sizes.

4.11. **For each hour of class time that occurs, one teacher-hour must be expended, while the number of pupil-hours of instruction that result equals the number of pupils in the class.** Average class size must therefore bear a mathematical relationship to pupil-teacher ratio and average teaching hours, as shown in Equation 1:

$$\begin{aligned}
 \text{Equation 1: The mathematics of staffing intensity} \\
 \text{Class size} &= \frac{\text{Pupil-hours}}{\text{Teacher-hours}} = \frac{\text{Pupils}}{\text{Teachers}} \times \frac{\text{Teachers}}{\text{Teacher-hours}} \times \frac{\text{Pupil-hours}}{\text{Pupils}} \\
 &\approx \text{Pupil-teacher ratio} \times \frac{1}{\text{Average teaching hours}} \times \text{Length of school day}
 \end{aligned}$$

⁸ The term “efficiency,” applied to education, is a source of controversy. The concept requires some measure of *outputs*, which might be pupil-years of education or number of graduates, or something more substantive, such as learning as measured by scores on some kind of standardized test. The concept also requires some measure of inputs, which obviously include state spending on salaries, facilities, goods and services in schools, but might be extended to include private inputs such as money spent on textbook and school materials, spending by parents on private tutoring, and even pupils’ own effort level. That Tajikistan is lacking in output measures that would facilitate comparisons of results across the country limits the scope of efficiency analysis, but efforts to understand where new funds will have the greatest impact must nonetheless be made.

High staffing intensity can certainly improve school efficiency interpreted as cost per pupil. It may not improve school efficiency in terms of cost per graduate, if, for example, larger class sizes induce substantially higher dropout rates. Even if it does reduce costs per graduate, it may not improve efficiency in terms of real student learning per somoni, if large class sizes harm the learning environment, so that pupils stay in school but learn less than they would have. Nonetheless, there is reason to believe that a limited increase in class sizes could improve *all* these measures and potential measures of efficiency.

Which implies the following three rules:

all else equal, the higher the pupil-teacher ratio, the higher the class size;

all else equal, the higher the average teaching hours, the lower the class size; and

all else equal, the longer the school day, the higher the class size.

4.12. We can see this mathematical relationship roughly borne out in Table 13, which shows PETS statistics on the average teaching hours, pupil-teacher ratios, and average class sizes in Tajik general schools. Because the average teacher work-week, taken across all regions, is generally similar to the number of hours that pupils spend in school, the pupil-teacher ratio roughly tracks the average class size, though it's a bit lower.

4.13. An important point in Table 21 is that smaller schools have lower pupil-teacher ratios and smaller class sizes. In a small school, in the absence of multi-grade teaching, classes can be no larger than the number of pupils in a grade, which may not be enough to fill a normal class. Large schools have more pupils to pack into a classroom, and thus benefit from economies of scale.

Table 21: Teaching hours, pupil-teacher ratios, and class sizes

School size (number of pupils)	Average teaching hours per week	Pupil-teacher ratio	Average class size
Under 150 pupils	22.9	10.1	11.1
From 150 to 225 pupils	26.1	13.9	16.3
From 225 to 300 pupils	22.6	17.5	18.4
From 300 to 400 pupils	18.5	14.2	17.9
From 400 to 500 pupils	21.6	16.9	20.7
From 500 to 600 pupils	22	17.7	21.6
From 600 to 700 pupils	23.6	21.7	22.6
From 700 to 1000 pupils	23.8	21.3	23.6
Over 1000 pupils	24.5	23.9	26
Total	23	16.4	18.4

4.14. One finding of the PETS is that the availability of teachers varies sharply through the country. Table 22 shows average teaching hours, pupil-teacher ratios, and average class sizes by oblast/region. Pupil-teacher ratio varies the most, from 26 in Dushanbe to 11 in GBAO. Where the pupil-teacher ratio is low, both class sizes and average teaching hours are lower. As expected, class size is related to school size: the rank order of oblasts and regions by average school size is the same as their rank order by average class size, with Dushanbe far above, and GBAO substantially below, the other three geographical subdivisions in both respects.

Table 22: Regional variation in hours, class size, and pupil-teacher ratios

Oblast	Average school size (number of pupils)	Average teaching hours	Pupil-teacher ratio	Average class size
Dushanbe	1,658	26.5	26.0	27.6
RRP	510	23.8	17.6	19.5
Khatlon	452	25.0	18.7	18.4
Sogd	423	20.4	12.4	17.3
Gbao	251	18.4	10.8	15.6
Total	476	23.0	16.4	18.4

4.15. Not all the variation in staffing intensity in Table 4 is explained by school size, however. The pupil-teacher ratio in Sogd is much lower than can be explained by school size alone. Khatlon’s schools are only slightly larger than Sogd’s, yet the pupil-teacher ratio in Khatlon is much higher. The pupil-teacher ratio in Khatlon is also a little higher than that of the RRP, even though schools in the RRP are larger. There appears to be a particular abundance of teachers in Sogd, and a shortage of teachers in Khatlon.

4.16. If teachers were more geographically mobile, this problem might be solved by transferring teachers from Sogd to Khatlon, but teachers’ geographical mobility is limited. In fact, almost half of the sample teachers seem to have changed schools in the course of their careers (because they report more years of “pedagogical experience” than years “teaching at this school”). 28% of the sample teachers (including 76% in Dushanbe) had moved from another rayon. Only 3% of non-Dushanbe teachers, however, had moved from another oblast. Since school salaries are small, they are unlikely to be adequate inducement for teachers to move around the country.

4.17. If class sizes are to be kept high, two variables—pupil-teacher ratios and average teaching hours—must be controlled. Pupil-teacher ratios must be kept high by constraining or reducing the size of the teaching staff, and/or average teaching hours must be kept low. We will see, however, that there are pressures to hire more teachers and to give teachers more hours. If rayons submit to these pressures, the result will be for class sizes to fall, to make the salary bill more expensive, and to cut into the fiscal space available to supply other school needs.

SUPPLY OF TEACHERS

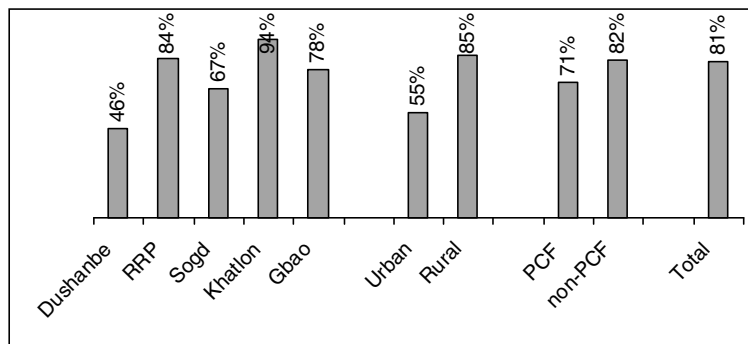
4.18. Tajikistan reportedly has an abundance of trained teachers, but low salaries deter many of them from working in the schools. As a result, many Tajik schools suffer from shortages of teachers. Teacher vacancies hinder some schools from teaching the full curriculum. Recent pay raises for teachers have attracted back some teachers who had left the profession, and have begun to ameliorate these problems. As pupil populations rise, ongoing new hiring will be necessary. Although the trend towards net hiring should help to solve the problem with vacancies and perceived teacher shortages, it will tend to lower the pupil-teacher ratio and raise per pupil costs, except to the extent that it is offset by growth in pupil populations.

(a) Principals report a lack of teachers

4.19. Despite a pupil-teacher ratio in the range of the OECD countries, the problem of lack of teachers is reported by a great majority of schools principals (81%). The PETS found that the incidence differs depending on whether the school is located in urban or in rural areas. The problem of lack of teachers is more acute in rural areas (85% of schools) than in urban ones (55%).

4.20. The problem is reported by a smaller proportion of schools in Dushanbe compared to the other oblasts. 93% of school principals in Khatlon reported it. One reason for this situation is that teachers – except for primary levels – are specialized and thus constrained, perhaps excessively, in the subjects they can teach.⁹ As a result, schools might have a low pupil-teacher ratio or an average teaching load while experiencing at the same time a shortage of teachers. In urban areas, there is a larger pool of teachers with different skills and this explains why the problem is reported by a lower proportion of principals than in rural areas.

Figure 9: Proportion of principals that reported lacking of teachers



(b) Teacher vacancies hinder the teaching of the curriculum

4.21. According to PETS data, 71% of general schools in Tajikistan have one or more vacancies. If the vacancy rate is calculated as reported vacancies over desired teachers, where desired teachers is current teachers plus reported vacancies, the median vacancy rate is 4%, and one-quarter of schools have vacancy rates of 10% or more. Vacancies do not necessarily translate into class hours going untaught—in some schools, other teachers can fill in the gaps—but they usually do not. In 47% of schools, principals report at least some hours which should be taught but are not.

4.22. Table 23 shows the distribution of teacher vacancies by school size and location. The main differences are between rural and urban schools, although larger urban schools also seem to have more vacancies than smaller ones.

⁹ Requiring a high degree of specialization of teachers makes staffing schools more difficult, but there are also, of course, potential pedagogical costs when teachers are less specialized or teach outside their area of specialization. In this case, trade-offs between curricular and budgetary desiderata must be considered.

Table 23: Teacher vacancies as a share of staff positions

School size (number of pupils)	Location	
	Urban	Rural
Under 150 pupils		9%
From 150 to 225 pupils		9%
From 225 to 300 pupils	0%	14%
From 300 to 400 pupils		8%
From 400 to 500 pupils	1%	7%
From 500 to 600 pupils	2%	9%
From 600 to 700 pupils	1%	8%
From 700 to 1000 pupils	6%	8%
Over 1000 pupils	4%	8%
Total	3%	9%

4.23. Table 24 shows the share of schools where subject-hours are untaught, by subject. Thus, in 36% of rural schools, foreign language subject-hours are not taught because of a lack of teachers. Urban schools do better in foreign languages but suffer from vacancies in IT and science. Clearly, although most principals do not regard lack of teachers as the most urgent of their problems, teacher vacancies undermine the ability of a sizeable minority of schools to teach the curriculum.

Table 24: Subjects that go untaught because of teacher vacancies

Subject	Percentage of schools where subject hours are not taught	
	Urban	Rural
Alphabet and Reading	5.1%	12.7%
Chemistry	11.2%	8.4%
Foreign Language	13.2%	36.2%
IT	15.6%	10.2%
Math	11.1%	7.3%
Physical Training	3.1%	5.4%
Physics	13.0%	5.5%
Tajik language in classes with other languages of instruction	2.1%	14.2%

(c) Hiring of teachers:

4.24. We turn to the size of teaching staff and the recruitment of teachers during the last two academic years. This is important since a great part of the budget for education is spent on human resources. According to the *tarifikatsya*, or payroll documents, the average number of teachers as of September 2005 was 29 teachers per school. The size of the teaching staff is on average twice higher in urban than rural areas and higher in Dushanbe and Sogd compared to the other oblasts. This is because school sizes are in general higher in urban areas, especially in Dushanbe than in the other areas.

4.25. In 2004, the President signed a resolution that calls for an increase in salaries in the public sector. The increase in the education sector is set according to the grade. For the pre-school and primary schools (1-4 grades) the increase is set to 60%. Secondary schools (5-11) receive an increase of 60% and the rest of the education sector

receives an increase of 50%. The raise in salary occurs effectively two years later, in 2006.

4.26. To investigate whether this raise has allowed schools to recruit more teachers than usual, we calculate the net increase in the number of teachers during the last two academic years. We calculate the net increase as the difference between the number of teachers that have been hired during the academic year and the number of teachers that quitted the profession for any reason including death. To control for the school size, we report the increase as a percentage of the total number of teaching staff at the beginning of the academic year. Results are reported in the second panel of the Table 25.

Table 25: Size and increase in the number of teaching staff

	Average number of teachers as of:		Net increase in the number of teachers for the academic year (%)	
	Sep-05	Sep-06	2005-2006	2006-2007
	(1)	(2)	(3)	(4)
Dushanbe	56 (7.6)	62 (7)	2.4 (0.9)	10.1 (1.2)
RRP	27 (3.1)	29 (3.2)	0.4 (1.3)	5.4 (2.1)
Sogd	35 (5.7)	34 (5.5)	-2.8 (1.7)	-1.4 (2)
Khatlon	21 (4.7)	22 (4.7)	0.9 (0.8)	4.6 (2.2)
Gbao	27 (8.3)	27 (7.4)	-0.8 (1.3)	-3.3 (2.5)
Urban	56 (3.7)	57 (3.6)	-0.1 (1.1)	4.1 (1.2)
Rural	24 (2.9)	24 (2.9)	-0.4 (0.8)	2.5 (1.4)
PCF	38 (6.1)	38 (5.9)	-2.3 (2.5)	5.6 (4)
non-PCF	27 (3.1)	27 (3.1)	-0.2 (0.7)	2.4 (1.3)
Total	28 (3)	28 (3)	-0.4 (0.7)	2.7 (1.3)

4.27. During 2006/2007, when the salary increase took effect, the number of teaching staff increased on average by 2.7%, compared to a decrease by 0.4% during the previous academic year. Although other causes for the change are possible, the result suggests that the pay raise helped to attract teachers back into the system. However, as we have seen, the pay raise has not solved the vacancy problem.

4.28. Teacher supply is most responsive to salaries in urban areas, but rural schools benefit too. The largest increase in teaching staff after the pay raise occurred in Dushanbe, where the size of the teaching staff increased by more than 10%, after a 2.4% rate of growth in 2005/06. By contrast, the size of the teaching staff *decreased* by 1.4% in Sogd, though this decrease was slower than in 2005/06. However, Sogd is comparatively well-supplied with teachers and is better able to afford negative net hiring. In Khatlon, where staffing intensity is high and the vacancy problem is most severe, the impact on net hiring of the pay raise was less than in Dushanbe but still substantial. **Meanwhile**, in GBAO the decline accelerated. These results suggest that pay raises can help reduce teacher vacancies (at a cost), but may not be able to solve the problem fully in more remote areas where teachers are just not available.

TEACHING HOURS

4.29. The more hours teachers teach, the more they are paid. Teachers already teach, on average, more than the official *stavka* or standard workload, and the median teacher does not want to teach more hours than are currently assigned to him. Nonetheless, on balance, **both** teachers and principals lean towards wanting slightly larger workloads. Increased teacher workloads mean greater staffing intensity, higher per pupil costs, and lower efficiency.

4.30. The *stavka* system determines the number of teaching hours a teacher is entitled to given his education level and his pedagogical category. It also determines the teacher's base salary. A *stavka* represents 18 teaching hours per week for primary level and 16 for the secondary level. However, teachers may be assigned more than one *stavka*, with proportionally higher pay.

4.31. The hours worked by sample teachers range from 12 hours (5th percentile) to 39 hours (95th percentile) with a median of 25 hours per week. Average teaching hours at the school level vary slightly less, from 15 (5th percentile) to 32 (95th percentile), with a median of 24 hours per week. 18% of principals thought the workweek at their schools was excessive, 50% thought it was appropriate, and 32% thought the workweek was too low. Not surprisingly, these opinions were correlated with the average workweek, as shown below in Table 26.

Table 26: Principals' attitudes on workweek

Do you consider teacher's hourly load per week in your school - high, appropriate, or low?	Share of principals answering	Average teaching hours in these schools
High	18%	31
Appropriate	50%	23
Low	32%	18
Total	100%	23

4.32. A majority of teachers (64%) are rather satisfied with their actual teaching hours, and of the remainder, most want to teach more than want to teach less. 27% of teachers who were interviewed said that they personally would like to teach more. The imbalance may be interpreted as slight underemployment among Tajik teachers. This may be one reason why extra classes are created in some schools: principals are responding to demand from teachers for more hours of work.

Table 27: Teachers' attitudes on the workweek

Would you like to teach more than, less than, or the same number of hours as you teach now?	Share of sample teachers answering	Average hours taught by these teachers	Average teaching hours desired by these teachers
More	27	20.3	27.8
Less	9	30.8	21.2
As many as now	64	27.2	-

4.33. A great majority of principals (75%) reported that teachers want to teach more in order to increase their salary. Teachers have the same perception about their colleagues: 65% of them **think** that most teachers in their school want to teach more in order to increase their salaries. (Principals may have meant that *some*, not necessarily most, teachers wanted an increase in hours.) There is considerable geographical variation in teaching hours, as shown in Table 28, which reports the average number of teaching hours per week and per teacher¹⁰:

Table 28: Summary statistics on the average number of teaching hours per week

	Mean	Min	Max
Dushanbe	26 (0.9)	20	33
RRP	24 (0.7)	17	34
Sogd	20 (1.9)	12	43
Khatlon	25 (1.6)	13	43
Gbao	18 (2.7)	13	24
Urban	23 (0.7)	12	43
Rural	23 (1.0)	13	43
PCF	24 (1.1)	14	33
non-PCF	23 (0.9)	12	43
Total	23 (0.9)	12	43

4.34. **The weekly load of a teacher is on average 23 hours.** There is not a significant difference across urban and rural areas, or across PCF and non-PCF schools. Across oblast, teachers in Dushanbe, Khatlon and RRP have a higher number of teaching hours than in Sogd or Gbao. This variation across oblast may be explained by two factors: the lack of teachers and the need to give incentives to teachers in order to keep them. The reason is that the higher hourly loads are observed in oblasts where there is a higher-than-average proportion of principals complaining about lack of teachers: Khatlon and RRP.

CLASS SIZE DECISION-MAKING

4.35. **As we have seen in the last two sections, at the school level there is a desire to hire more teachers and increase teacher workloads.** Both desires are understandable. Vacancies create an obvious demand for more teachers. Most teachers' work-week in the classroom are much less than those of typical full-time jobs, and although teachers are also responsible for grading and class preparation outside of class time, many might feel they could work more, especially when salaries are so low. Under the traditional system, where the locus of discretion is in rayons and jamoats, schools do not internalize the budget constraints, and have no reason to recognize the cost implications of their preferences. However, if schools were allowed to get what they want—more teachers and, in many cases, longer workweeks—class size would fall, and

¹⁰ This is calculated as the total number of hours taught in the school per week divided by the number of teachers teaching the term when the survey was completed. We compute the same table using the hourly load per week from teachers' data but numbers are not significantly different.

education spending would have to increase and/or be diverted from other expense categories to salaries.

4.36. To prevent this, rayons generally have the final say on when classes can be split, as may be seen in Table 29. Class splitting is the mechanism by which schools, were they allowed to do so, could create more hours of teaching work for current teachers and/or new hires. Controls on class splitting are the means by which officials at the rayon level can keep staffing intensity under control. 88% of RED heads report that they, or another RED official such as an inspector or an “economist” (something like a resource manager) make the decisions (in some cases jointly) on class splitting, while only 27% say that principals (even jointly) make the decisions.

Table 29: Decisions on class splitting are usually reserved for RED heads

Who makes the decisions on splitting classes?	Number of rayons reporting	Percent*
Principal	16	27%
RED Head	44	75%
School inspector (under RED)	10	17%
RED Economist	25	42%
All RED	52	88%
Teachers' union	3	5%
Other	1	2%

* The percentages do not add up to 100% because some RED heads gave multiple answers.

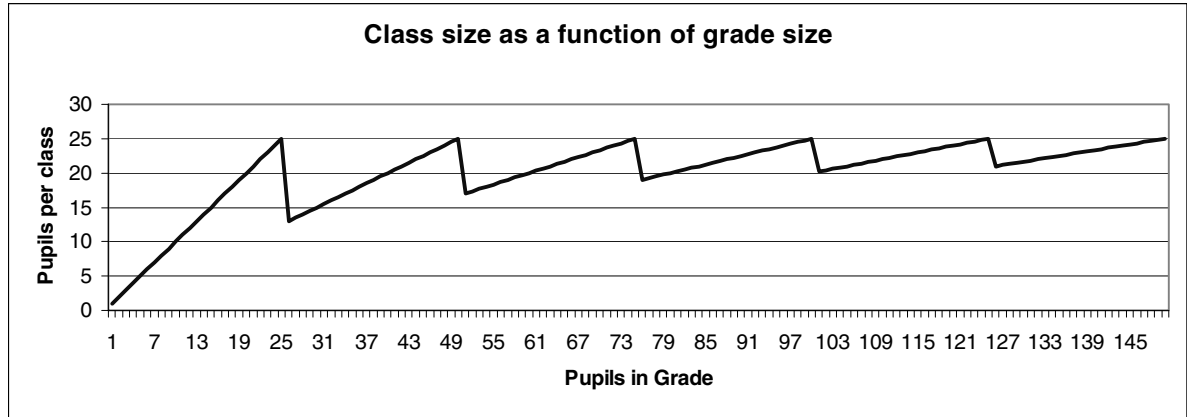
4.37. Although reserving class splitting decisions for the rayons is necessary under the system of local discretion, it has disadvantages. First, it slows down decision-making if approval from further up the hierarchy is needed. Second, because REDs are further from the learning process than principals, the quality of decision-making will probably be lower than it would be if principals made the decisions but were forced to internalize their budget constraints. Third, how do REDs make their decisions *fair*? A discretionary decision leaves REDs open to temptations to, or charges of, favoritism.

Design and ramifications of class splitting rules

4.38. Although education systems sometimes attempt to establish normative pupil-teacher ratios or class sizes, it is not possible, strictly speaking, to implement norms of this kind, because classes of a given size can be created only if the specified size is a divisor of the total number of pupils, and the number of pupils in a school or a grade is a variable that is typically outside schools' control and has no tendency to be a multiple of any reasonable class size norm. Thus, if there are 30 pupils in the 4th grade, it is not possible to implement a norm that each class should have 20 pupils. What is mathematically possible is to implement accurately is a *class splitting rule*, whereby the number of classes created is the minimum that can accommodate the pupils without any class being larger than a specified limit. If the class splitting rule sets the maximum class size at 20, 30 pupils could be divided into classes of 15, or of 20 and 10, or of 16 and 14, etc. If such a rule is applied strictly, there is no room for manipulation or preferential treatment.

4.39. Although a class splitting rule is intuitive enough, it has one perhaps surprising result. Because the number of classes has to be an *integer*, class size as a function of pupils per grade is somewhat oddly shaped, as shown in Figure 10.

Figure 10: The class size function, under a strict class splitting rule, is oddly shaped



4.40. Do rayons, in fact, employ such class splitting rules? Although questions about procedures and authority tend to be of particular interest to policymakers, it is difficult to put such questions in the field. Closed questions are difficult to frame in a non-leading way, and open questions yield answers that are difficult to process and usually not to the point. One PETS question, “How large must a class be in order to be split in two?” *assumed* that REDs were applying class splitting rules, and it was anticipated that the class splitting rule, since it is such a key budgetary variable and closely related to normative definitions of school needs, would be largely or entirely uniform for the country.

4.41. So it was surprising that there turned out to be significant *variation* in the class splitting rules reported by rayons, as shown in Table 30. The PETS team was told during the design stage that the class size norms were 25 for grades 1-4 and 30 for grades 5-11, and expected the RED heads’ answers to confirm this. It turned out that there were indeed clear *modes* at these points—over half of the RED respondents said either the norm or *one more than* the norm, presumably noticing that strictly speaking, a class must be *above* the norm to be split. However, many REDs gave answers that were clearly more or less than the expected norms.

Table 30: Reported class splitting rules vary from rayon to rayon

How large must a class be in order to be split into two? [Repondent: RED head]	Grades 1-4	Grades 5-9	Grades 10-11
17	1		
20	1		3
21		1	3
23			1
24	2	2	1
25	28 (48%)	8	6
26	10	4	4
28	1	1	
30	6	26 (44%)	26 (44%)
31		5	4
32	1	1	1
34		1	2
35			1
36	2	2	
37			1
38	1	3	
39	1		1
40	3	2	3
42		2	1
45	1	1	1
Don't Know	1		

4.42. A challenge in interpreting the findings is that rayons may not think in terms of class splitting rules, so RED heads' answers may be somewhat arbitrary. That is, if decisions are made on the basis of several criteria, so that, for example, one proposal to split a class of 25 might be approved while another proposal to split a class of 30 might be rejected, then there may be no strictly and generally true answer to the question, and several roughly or partially true answers.

4.43. A regression shows that rayons' reported class splitting rules are higher where average class sizes are higher. In the sample as a whole, average class sizes are about five pupils less than average class splitting rules, and show the same standard deviation. There are, however, entire schools—23% of urban schools, 3% of rural schools—where the average class size is higher than the class splitting rule reported by the rayon.

(a) Many classes are larger or smaller than the rule requires

4.44. Because the PETS has data about the size of every class in every sample school, it is possible to apply any proposed class size rule to the data, “predict” the number of classes which ought to be observed in any grade in any school, and then compare this to the number of classes which are actually observed. We can thus determine whether the class splitting rules are accurately applied. The results are somewhat confusing. Extrapolating from the sample data, there are 45% of Tajik general schools in which class sizes are consistent with the standard class splitting rule (split above 25 for grades 1-4; split above 30 for grades 5-11). Of these, almost half are very

small schools where there are not enough pupils to do *any* class splitting under the class splitting rule, presumably making the rule easy to follow.

4.45. In 26% of schools, there are only “excess” classes. That is, some grades have “too many” classes, which should not have been created if the class splitting rule were strictly followed, but there are no classes that should have been split and were not. In 18% of schools, there are only “missing” classes, that is, some classes that ought to exist if the class splitting rule were followed do not, meaning that some classes are “too large;” but none are too small. Finally, in 10% of schools, there are both “excess” and “missing” classes, with the number of classes in some grades exceeding, in other grades falling short of, the norms.

4.46. The above calculations use the standard 25/30 rule as the benchmark against which to compare the actual class size distributions. Alternatively, we can use as a benchmark the class splitting rules reported by the RED itself. (For some rayons, the rule is the same.) Even fewer schools—39%—have class size distribution consistent with the rules reported by the rayon. Again, rule-consistent class size distributions are most common in smaller schools: the median pupil population in schools that follow the rule is 189, and almost half of them have only one class per grade. 31% exhibit only “excess” (compared to the rule) class splitting; 18% exhibit only “insufficient” class splitting; and in 12% of schools there are some grades where class splitting is excessive and others where it is insufficient. The patterns are similar to those observed if we benchmark class size distribution against the standard class splitting rule. What is clear is that the deviations of class size from the standard rule are *not* explained by the idiosyncratic class splitting rules reported by the rayons.

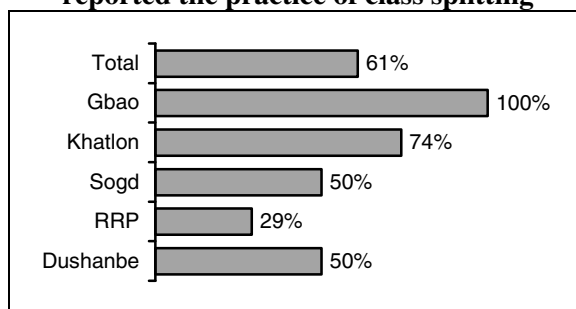
4.47. Granted that deviations from the class splitting rule are noisy, with some deviations in both directions, what is the overall effect? As shown in Table 31, the effect depends on the region of the country. In the RRP, Khatlon, and GBAO, more classes were actually observed than were predicted by the rule, so that “excessive” (compared to the rule) class splitting results in “too many” classes, and presumably too high a budget for teachers’ salaries. In Dushanbe and Sogd, the opposite holds: fewer classes are actually observed than are predicted by the rule, so that a strict application of the rule would require class splitting and would increase the number of classes and the wage bill.

Table 31: Deviations from class splitting rules result in a few “too many” classes

Oblast	Total classes actually observed	Total classes predicted by class splitting rule	“Missing” classes; classes predicted by rule but not observed	“Excess” classes, results of excessive class splitting
Dushanbe	5,405	5,976	698	127
RRP	18,177	17,905	570	842
Sogd	22,269	22,459	795	606
Khatlon	30,087	29,684	881	1,284
Gbao	2,744	2,331	3	415
Total	78,683	78,356	2,947	3,274

4.48. There is a perception among rayon chairmen that school principals tend to split classes in order to get more *stavkas* and then increase the number of working hours for teachers. This problem is also known as the problem of ghost classes. Figure 11 reports that 61% of rayon chairmen reported that such practice happens although the frequency at which it happens might differ (34% reported that it happens often or sometimes and 27%, that it happens rarely). The practice seems to be more frequent in some oblasts than in the others: it is reported by 29% of rayon chairmen in the RRP and 74% in Khatlon.

Figure 11: Proportion of rayon chairmen that reported the practice of class splitting



(b) Physical constraints on class size

4.49. When principals think there are overfull classes, the most common reason they are prevented from doing so appears to be a lack of classrooms. PETS asked principals, “Are there overfull classes in your school?” This question could be understood as, “Are there any classes in your school the size of which exceeds the class splitting rules?” but that does not seem to be how principals interpreted it. In schools where the number of classes is enough to satisfy the rule, 37% of principals nonetheless answered “Yes,” while 24% of principals answered “No” in schools where the number of classes is not enough to satisfy the rule. Clearly, even if the total number of classes in the republic as a whole is slightly excessive, there are overfull classes by the standard, either of the class splitting rule, or of the perceptions of principals and RED heads. Why? While the budgetary constraints embodied in the control numbers may force the REDs to cut back on class splitting, the major constraint appears to be in facilities.

4.50. PETS asked principals who said their schools had overfull classes about two factors that might be obstacles to splitting classes: a lack of teachers, and a lack of classrooms. The answers are shown in Table 32.

Table 32: Why don't you split classes?

Are the following factors obstacles that prevent you from splitting classes (for principals who reported that there are “overfull classes in the school”)?	Lack of teachers?		
	Yes	No	Total
Lack of classrooms			
Yes	672	901	1,573 (90%)
No	146	19	165
Don't know		1	1
Total	818 (47%)	920	1,739

4.51. More than 90% of principals said that lack of classrooms prevented class splitting. A classroom capacity constraint can affect class size in two ways: (a) the size of a classroom limits how far class size can increase, since the number of pupils in a class cannot be more than fit in the classroom, and (b) the number of classrooms can limit class splitting, since a newly-created class needs a classroom in which to meet. Without detailed data on classroom capacity, PETS cannot offer detailed analysis of how this factor affects staffing decisions, but both of these effects may be important.

COMPENSATION OF TEACHERS

4.52. There are three components in the teachers' income: the base salary, several supplements and bonuses, and allowances. In addition, a teacher can earn additional income from holding an administrative position or leading some class activities. PETS data shows that in 2006, there were large inter-regional variations in total compensation driven by supplemental payments, even though salaries were consistent throughout the country. However, in April 2007, a reform suppressed most of the supplements in favor of an increase of the base salary, so these variations may no longer exist.

(a) Monthly salary:

4.53. Although the stavka is the base unit of salary, teachers are allowed to take on more than one stavka in order to get more salary. The monthly salary that we report in this section is based on the actual load of teachers instead of the official rate of *stavka*.

Table 33: Average amount received as a salary for November 2006 (in Somoni)

	Monthly		Hourly	
Dushanbe	138	(5.4)	4.9	(0.2)
RRP	124	(4.5)	5.4	(0.2)
Sogd	110	(3.2)	5.4	(0.1)
Khatlon	134	(3.4)	5.1	(0.1)
Gbao	93	(8.4)	5.7	(0.6)
Urban	132	(3.6)	5.4	(0.1)
Rural	118	(2.4)	5.3	(0.1)
PCF	126	(4.0)	5.3	(0.2)
non-PCF	121	(2.2)	5.3	(0.1)
Total	121	(2.0)	5.3	(0.1)

4.54. Teachers were asked to report their amount they received as salary in November 2006. In Table 33, we report the average amount of this salary. **Teachers received on average 121 somoni in November 2006.** The average salary is higher in oblasts such as Dushanbe or Khatlon than in the other oblasts. However, this is because teachers in these oblasts have on average a higher number of working hours.

4.55. We have highlighted the fact that the average number of hours per week is higher in Dushanbe, Khatlon and RRP than in the other oblasts. To provide an idea, we report in the second column of the table an estimate of the hourly salary of a teacher: it is calculated by dividing the salary of November 2006 by the average number of teaching hours per month in 2007. In doing so, we assume implicitly that the average salary in 2007 is not very different from the salary received in November 2006. Results tend to confirm that higher salaries in Dushanbe, Khatlon and RRP are because of higher number of hours per week. The estimated hourly salary is generally lower in these regions than in the other oblasts. As Table 34 shows, hourly salaries are typically a bit higher in urban areas relative to rural areas in the same oblast.

Table 34: Average salary received in November 2006 (in somoni)

	Monthly		Hourly	
	Urban	Rural	Urban	Rural
<u>By oblast</u>				
Dushanbe	137.6 (5.4)	-	4.9 (0.2)	-
RRP	139.1 (12.7)	120.4 (4.6)	6 (0.5)	5.2 (0.2)
Sogd	124.9 (6.3)	105.3 (3.6)	5.4 (0.2)	5.5 (0.2)
Khatlon	136.5 (5.1)	133.9 (3.9)	5.3 (0.3)	5 (0.1)
Gbao	101.4 (12.8)	91.9 (9.3)	7.1 (0.6)	5.5 (0.6)
<u>By pedagogical category:</u>				
High	156.9 (6.5)	142.8 (4.2)	6.3 (0.2)	6.1 (0.2)
1 st category	129.5 (5.6)	118.4 (4.3)	5.1 (0.2)	5.4 (0.2)
2nd category	112.1 (7.0)	106.4 (3.9)	4.6 (0.2)	4.6 (0.2)
Teacher/general	103.5 (4.1)	87.6 (3.3)	4.5 (0.3)	4.2 (0.2)

Table 34 also shows how salaries rise with pedagogical experience.

(b) Supplements to salary:

4.56. At the time of data collection in 2006, there were a number of school related activities from which teachers derived additional income, including class activities, administrative position, bonus payments, premiums and compensation payments. (Since then, however, the compensation system has been reformed.) We report in table 10 the average income from these sources.

(iii) Class activities:

4.57. These are activities such as class leading, supervision of training lessons, computer classes and united methods, coterie and out of school activities. Teachers are entitled some supplements based on some additional functions. Teachers receive an entitlement of:

- 15% of salary for checking and correcting written assignments;
- 20% for serving as a class head;
- 15% for teaching computer classes.

4.58. There is also a supplement according to the grade and or subject: teachers for grade 1-4 receive 10% and teachers for grade 5-11 receive a supplement depending on the subject: 15% for language and literature subject and 10% for some specific subjects such math, drawing. The most frequent activity is class leading: 80% of teachers have fulfilled such duty during the period of September to December 2006 and received on average 15 somoni per month.

(iv) Administrative position:

4.59. Teachers can earn additional income from holding an administrative position. These positions are the ones of deputy director (on training, education or economic activity), zavhoz, accountant, secretary, librarian, laboratory assistant or electrician. The PETS reports that 18% of teachers have held any of these positions during the period of September to December 2006. The most frequently-held positions are those of deputy director on training activity and on education activity. The average income derived from holding an administrative position is 46 somoni per month. Since relatively few teachers hold such positions, the average across the whole population of teachers is 7 somoni per teacher.

(v) Bonus payments:

4.60. Bonus payments are made for corrections of exercise-books or to teachers for the purchasing of notebooks and pens. A majority of teachers (54%) declared that they received a bonus for the correction of exercise-books (for grades 5 to 11, it is related to drawing, physics and mathematics). These teachers received on average 9 somoni per month for this activity. Another 27% of teachers have received a bonus for the correction of exercise-books for mother tongue (Tajik) on Russian and Arabic script and received on average 11 somoni. There is also a bonus of 6% for competence in a foreign language and another bonus to librarians for working with the book fund of the school. The average across teachers from all the bonuses is 10 somoni per teacher.

(vi) Premium payments:

4.61. The PETS collected information on two sources of premium payments: a premium payment in honor of Teachers' Day and a premium for the best teacher of the rayon/city. 11% of teachers received a premium payment on the occasion of Teachers' Day. The proportion of teachers that received such payment is negligible in the oblast such as Khatlon (1%), Sogd (0%) and Gbao(3%). On the contrary, 93% of teachers from Dushanbe and 22% of teachers from RRP received such premium. They received on average 75 somoni. If we consider all the teachers, the average premium payment received is 9 somoni.

(vii) Benefit and compensation payment:

4.62. As of early 2006, when the PETS data were collected, teachers were entitled to some allowances as is determined by the Education Law of April 29, 2004. These included medical allowances, allowances to cover partially the cost for public utilities and the provision of housing for new and young teachers in rural areas.

These allowances are to be provided by local government and whether they are provided or not depends on the local economic situation. For example, in Dushanbe, public transportation was free for teachers. In addition, they received a discount for utilities charges and loans for the purchase of an apartment. The situation may have been different in the other oblasts. These allowances were, however, abolished in the same year, and are no longer paid.

4.63. A major component of allowances is the 13th salary. This is why the average of benefits and compensation payment is high: 43 somoni per teacher. Nearly, half of teachers (49%) have received a payment for medical allowance when going on leave or 13th salary. The second source is payment for communal service such coal, electricity: 21% of teachers received a payment for such service.

4.64. The problem with having so many bonuses and supplements is that a clear allocating rule is sometimes missing. This creates room for lobbying. With the salary reform that entered into force in April 2007, the base salary has integrated some of the supplements and only two of them are preserved: a supplement for class teacher (15%) and a supplement for notebook checking (20%);

Table 35: Teachers income from school related activities (in somoni)

	Class activities		Administrative position		Bonus payments		Premiums		Benefit and compensation payments		Total(*)		Grand Total (including salary)	
Dushanbe	19	(4)	2	(1)	10	(1.3)	103	(5)	83	(9.2)	178	(11)	311	(13.5)
RRP	12	(1.1)	7	(1.6)	14	(1.2)	12	(2.5)	118	(15.8)	106	(11.3)	221	(13.8)
Sogd	11	(1.2)	7	(1.4)	7	(0.7)	1	(0.5)	17	(5.1)	35	(5)	142	(5.9)
Khatlon	17	(0.9)	6	(1.2)	12	(0.8)	1	(0.6)	28	(3.2)	51	(3.8)	183	(6.4)
Gbao	8	(2.3)	13	(6)	12	(3.3)	1	(0.7)	60	(8.5)	88	(15.1)	167	(22.2)
Urban	14	(1.3)	5	(1.2)	11	(0.7)	28	(3.2)	46	(6.8)	86	(7.3)	212	(9.3)
Rural	13	(0.7)	8	(1)	10	(0.6)	3	(0.7)	42	(4.5)	60	(4.1)	174	(5.3)
PCF	14	(1)	8	(1.9)	14	(0.9)	13	(2.6)	68	(11.6)	96	(11)	211	(13.2)
non-PCF	13	(0.7)	7	(0.8)	10	(0.6)	8	(1.1)	40	(4)	63	(3.8)	180	(4.9)
Total	13	(0.6)	7	(0.8)	10	(0.5)	9	(1)	43	(3.8)	66	(3.6)	183	(4.7)

Standard Errors in parentheses.

(*) The total is not equal to the sum of elements because the number is not the same across the categories. Teachers who were unable to provide the amount of the transfer were excluded from the calculations. Those that didn't receive anything are assigned 0.

Table 36: By teacher's pedagogical category: income from school related activities

	Administrative position	Class activities	Bonus payments	Premiums	Benefit and compensation payments
High	11.9 (4.4)	13.4 (1.8)	12.2 (1.3)	18 (4.5)	43.8 (10.4)
1st category	4.6 (2.3)	15.7 (2.5)	11.2 (1.4)	20 (6)	74.2 (23)
2nd category	0 (0)	8.1 (2.1)	10.5 (1.7)	13 (7.8)	45.1 (15)
Teacher/general	2.9 (1.5)	7.9 (1.3)	8.4 (1)	23.2 (8.8)	50.2 (25.2)
High	14.3 (2.9)	13.3 (1.4)	10.9 (1.1)	2.9 (1.7)	31 (6)
1st category	12.9 (3.9)	12.2 (1.9)	12.4 (1.6)	4.2 (2.3)	53.8 (10.6)
2nd category	0.3 (0.3)	12.6 (1.7)	10.4 (1.8)	0.4 (0.4)	56 (11.2)
Teacher/general	8.4 (2.7)	10.4 (1.5)	7.2 (1.2)	0.8 (0.8)	16.3 (6)

Standard Errors in parentheses.

ADMINISTRATIVE AND TECHNICAL STAFF

(a) Administrative staff:

4.65. Administrative staff concerns positions such as deputy director, accountant, librarian or secretary. There are on average 80 pupils per administrative staff. The ratio of pupils to the number of administrative staff is higher in urban areas and especially in Dushanbe showing that the relation is not linear. Whether the position exists or not depends on the school size. In Table 37, we report the proportion of schools having a given administrative position by school size. We divide the sample in two groups: schools with large size and small schools. Schools with more than 500 pupils are considered as being large. **Except for the position of director which is available in all the schools, the other positions in general are more frequent among large size schools than schools with small size.** For example, the position of Deputy Director on education activity is available in 93% of schools with more than 500 pupils but in only 38% of school with 500 pupils and less.

4.66. The Stavka Note (Steiner-Khamsi (2007)) reported that salaries for administrative staff are determined based on the number of students enrolled in the school and are on average lower than the stavka rate of teachers. Hence, there is incentive for them to take on a teaching load. The survey collected information about the number of administrative staff that have also teaching hours. **Results show that an important majority of them are involved in teaching.** In all the oblasts except in Gbao, the proportion of administrative staff involved in teaching activities is above 75%. It reaches 86% in Khatlon.

Table 37: Proportion of schools with a given administrative position by school size

Position:	1-500 pupils	500 pupils and +	Total
Director	100.0	100.0	100.0
Deputy Director:			
- Training activity	73.9	99.0	83.1
- Education activity	37.7	92.7	57.8
- Economic activity	6.6	25.7	13.6
Clerk	0.0	9.4	3.4
Secretary	11.8	17.2	13.8
Accountant	10.9	18.3	13.6
Laboratory assistant	15.6	37.9	23.7
Library head	27.8	71.4	43.7
Librarian	49.6	53.6	51.1
Instructor	9.3	1.0	6.2
Military instructor	29.0	86.4	49.9
Psychologist	4.9	8.0	6.1

4.67. According to the PETS, administrative staff teach on average 14 hours per week, which is half the average number of teaching hours for teachers. With the reform of April 2007, the salary of school administrators was raised to the level of that of regular teachers. However, the three supplements they were used to receiving were abolished: supplement for books and newspapers (10%), medical supplement (1/12 of the base salary) and a premium of 2%.

(b) Technical staff

4.68. Technical staff or auxiliary staff refers to positions such as laboratory workers, secretary, cleaners, guards, etc. Their number is determined by the physical size of the school facilities. For example, a school is entitled to hire a cleaner per 500 square meters. Their salaries are slightly above the minimum wage. The Stavka Note (Steiner-Khamsi (2007)) reported that the average salary is between 24 and 27 TJS per month. The PETS has collected some data on non-teaching staff which, however, has not been analyzed in this phase of the analysis. This is an area for future research using the PETS data if and when such analysis will contribute to the policy dialog.

HUMAN RESOURCES – CONCLUSION

4.69. Tajik schools generally have reasonable pupil-teacher ratios and teacher workloads. However, many schools, especially in rural areas, are forced to leave gaps in the curriculum because of teacher vacancies. On average, class sizes are probably smaller than optimal, though they are not out of line with the patterns in the OECD and elsewhere, but there is notable variation across schools and regions. Decisions on class sizes, which are the key determinants of the per pupil budgetary cost of teachers' salaries, and indeed of general education as a whole, do not seem strictly to follow the standard rule that classes grades 1-4 should have at most 25 pupils, and grades 5-11 at most 30. Rather, class splitting decisions are subject to local discretion, and sometimes result in

“too few,” sometimes “too many” classes per grade, relative to the rule. Teaching hours vary widely, and while most teachers are satisfied with the hours they teach, about one-quarter to one-third would like to teach more, which may create pressures for class splitting that are constrained more by a lack of classrooms than by budgetary considerations. The recent rise in salaries has spurred a welcome acceleration in net hiring, but that does not ease the challenge of managing staffing efficiently.

4.70. A curriculum reform, which reduced the number of different specializations required in schools, could help to ameliorate two problems at once: it could (a) reduce requirements for specialized teachers, and thus the number of vacancies, and (b) satisfy the demand of some teachers to increase their hours by allowing them to take on other classes. The pedagogical merits of such a change are beyond the scope of this report, but if acceptable ways to streamline the curriculum could be found, they would make it easier to manage the human resource budget efficiently.

5. THE PER CAPITA FINANCING PROGRAM

5.1. In the National Strategy for Education Development, adopted by the Government of Tajikistan for the years 2006-2015, one of the components is the implementation of the per capita financing (PCF) program. The PCF program is expected to bring more transparency and efficiency in the system of resources allocation by allowing schools administrations to have more leverage in the management of the resources that are allocated to schools.

5.2. PETS findings confirm that the PCF program is being implemented as planned and is achieving its objectives. Although there is still room for improvement in PCF financial administration processes relative to the traditional financing system, it appears that the PCF program is promoting efficiency, transparency, and accountability. School principals do not always understand how the formula works. Still, the result of the formula—how much the school receives—is recorded in budgets which are possessed by schools and which in almost all cases proved to be consistent with budget information at the rayons. The PETS finds that school budgets are imperfectly in line with the official formula, particularly in Khujand. These and other small problems underline the need for due vigilance and adequate capacity-building as the PCF program is implemented at the national level. Nonetheless, the main conclusion is that the PCF concept has been successfully implemented and has made possible a degree of financial accountability unattainable under the traditional financing system.

5.3. Also encouraging is the evidence the PETS provides about the way limited resources are put to use. The PETS finds that PCF schools consolidate classes and economize on utilities and miscellaneous other inputs in order to spend more on supplies and repairs to facilities. As a result, reported problems in these two areas were significantly lower than in non-PCF schools. PCF schools were also more likely to receive goods and services corresponding to monies budgeted, and less likely to experience salary delays. All these findings are reflected in the reasons given by participants for the popularity of the programs.

PROGRAM DESIGN

5.4. *Per capita financing* is a reformed method of financing schools which has been introduced as a pilot program in selected rayons in Tajikistan. The main features of the reform are:

5.5. *School autonomy.* Instead of allocating funds to rayons to be distributed among schools at the rayons' discretion, funds are transferred directly to Treasury accounts, out of which the schools themselves can spend them. School budgets are no longer pre-allocated by economic classification. Instead, schools receive the funds as a

lump sum, and can allocate them among salaries, utilities, maintenance and repairs, stationery, and other expenses as they see fit.

5.6. Formula funding. The lump sum amount received by a school is determined by a formula, as a function of the number of pupils in the school. The formula includes a constant coefficient, the same for all schools in a given rayon, and a variable coefficient, which is multiplied by the number of pupils. The constant coefficient helps small schools to cope with the lack of economies of scale. The allocation of resources for recurrent expenditures for PCF schools is different from non-PCF schools: they are informed about the amount that is available to them and manage it according to their needs. The amount of resources that are allocated to them is determined by a formula that takes into account the number of students in the school and the total amount of resources available for education in the rayon budget. Schools are then informed about the amount available for them. They have the discretion of allocating it according to school's need. They prepare and submit their request to the treasury for payment.

5.7. The PCF system contrasts with the traditional system in several ways. Approved budgets (a) are available to schools, rather than to jamoats and rayons to execute it for them, (b) are a lump sum, rather than being pre-allocated by economic classification. There is a built-in attempt at assuring equity, because the formula supplies schools with funds proportionally to the number of pupils (plus a "constant coefficient" which compensates smaller schools for their lack of economies of scale). There are also incentives to manage money efficiently, because (a) decision-making is located in schools, which have the best information, and (b) schools face *hard* budget constraints and need not lobby for more cash. The availability of budgets in the schools opens the door to greater civil society participation in substantive school decisions, and also serves as an extra safeguard against leakage and corruption, since parents can find out the budget and make sure it's being used properly. At any rate, those are the theoretical benefits. How does the program work out in practice?

PROCESS AND AWARENESS OF PROCEDURES AMONG PCF PRINCIPALS

5.8. It is always a concern, when introducing a new program, whether participants will understand it and be able to execute it. Is the per capita financing reform operating as planned? And do school principals who are participating in the program understand it? The directors interviewed reported that the school budget was estimated on the basis of "number of pupils" or "the per capita financing formula," with some adding that the *tarifikatsiya* or payroll was also used to estimate budgets. Not all principals understand the formula itself: 39% answered "No" to the question, "Do you know what variables the formula consists of?" In Vahdat, most of the principals said they knew the values of these variable and constant components and gave consistent answers. Elsewhere most principals did not know and answers, when given, were erratic. A few directors reported that an adjusted formula was used for their schools. Since the number of pupils in the school is the variable that determines the size of school budgets, accurate information about pupil populations is critical for the program to run properly. That said, it is not essential for principals to understand the process by which their budgets are calculated, as long as they are calculated accurately.

(a) Counting pupils

5.9. Under per capita financing, schools with more pupils get more money, so there is a potential incentive for schools to exaggerate pupil populations. To check this, PETS enumerators did not conduct a headcount of pupils, which would have been disruptive of teaching, and impractical because most schools operate in shifts. But PETS data recorded the size of every class in every school based on school records, and this provides a source of evidence about pupil populations. We also asked principals what was the number of pupils *reported* for purposes of calculating the budget. A comparison of these two numbers may provide some indication of the accuracy of the pupil numbers used for budgeting purposes, though only as reliable as the records about classes.

5.10. Since some pupils may enter or leave a school during the year, we should not necessarily expect the number of pupils reported in the class lists to be the same as the number used for financing purposes. A consistent upward bias in the number of pupils used for budgeting might suggest manipulation of the financing formula. It might also reflect that pupils thin out during the year as some drop out, and school records had been updated. Anyway, PETS shows a lot of discrepancies, but no particular pattern. In about one-third of the schools, the budgetary number of pupils is the same as the summation of class sizes. In about one-third it is more. In about one-third it is *less*. Still, the few schools where the summation of class sizes substantially exceeds the budgetary number of pupils give grounds for ongoing vigilance.

(b) Audits

5.11. Audits occur frequently. 90% of principals reported that some kind of financial audit had been performed at the school in 2006. 61% reported audits by the rayon financial department, 51% by financial inspections, and 31% by the Office of the Public Prosecutor. The median school reported that audits occurred 2-3 times per year. Auditors verified the number of pupils in the school and the payroll documents (*tarifikatsiya*). A few of the audits found violations. The PETS has no information on how the audits were conducted, or whether they went into detail about expenditure of school monies.

(c) Lump sum payments

5.12. **Most principals—80%—confirmed that they received their school budgets as a lump sum not pre-allocated by economic classification.** As far as it goes, this is how the system is supposed to work. But another 20% answered “no,” they hadn’t. Did those principals receive their budgets differently or did they just misunderstand the question? It does not seem to be the case that one rayon is doing things differently, because the “No” answers are scattered across four of the five rayons. The answer may reflect a communication failure, or a poor understanding on the part of principals, or there may be some procedural anomalies.

(d) Applying the financing formula

5.13. A strictly accurate application of the financing formula could easily be recognized mathematically. For example, if the lump-sum value of school budgets were regressed against the number of pupils used in calculating the budget, allowing for a constant term, the resulting coefficients would be the constant and variable coefficients of the financing formula, while R-squared would be equal to 100%.

5.14. The per capita financing rayons do not meet this standard exactly, but they come close. Table 38 shows the results of regressions of budgets against numbers of pupils within each of the per capita financing rayons. The higher the R-squared, the closer school budgets conform to the financing formula. Figures over 95% are impressive. Khujand and Yavan have room to improve, but mostly formula financing seems to be in effect.

Table 38: The empirical formula: patterns in budgets and pupils observed in the data

Rayon ¹¹	Constant coefficient as observed in the data	Variable coefficient as observed in the data	R-squared
Vahdat	13,999	97	96%
Khujand	26,201	96	86%
Yavan	11,553	91	92%
Kuljabsky	34,144	78	96% ¹²

5.15. As Table 38 shows, the formulas used vary considerably from rayon to rayon. This possibly raises equity issues. Are there legitimate structural reasons why schools in one rayon are getting more funding than schools in another rayon that have the same number of pupils? As the per capita financing reform is expanded to the national level, this issue may be worth addressing.

(e) Who performs budget allocations, and “on what basis?”

5.16. While most principals say that budget breakdowns are performed by the school principal and/or the school accountant, 16% did not, reporting rather that the rayon or city education or finance departments did the breakdowns. This finding suggests that capacity building for the reform remains incomplete. When asked “on what basis” allocations by economic classification were performed, most principals answered “according to the needs of the school,” while a few mentioned specific needs such as utilities or repair.

¹¹ For a fifth rayon, Khorog, a regression of total budgets against pupils and a constant could not be conducted because there were only two observations.

¹² Three schools had to be excluded from the Kuljabsky regression because their directors did not know what their budgets were.

(f) Financial reporting

5.17. Directors report that budget estimates (smetas) are submitted to the rayon education departments for approval. There was one case where the RED did not approve the budget and required adjustments to salaries, pension contributions, and stationery. Most principals reported a turnaround time for budget approvals of three days or less, but 10% reported delays of 10 days or more.

5.18. About half of principals (48%) reported that they had unexecuted funds in their budgets at the end of fiscal year 2006. Of these, 70% reported that the funds were “returned to the local budget,” while the others said they were “transferred to the next year.” PETS did not collect information on the amounts of unexecuted funds. Budget execution reports were submitted to rayon financial departments at the end of the year. Sometimes other statements were also submitted.

(g) Institutional feasibility

5.19. One reason to introduce a reform as a “pilot” is to see if it is feasible to implement. It appears that the school per capita financing reform is feasible, though not without challenges. The PETS data show that the per capita financing program is operating as planned, for the most part, even though funding patterns deviate slightly from the formula, and capacity building and awareness of the new rules is not completely developed.

REVIEWS OF THE PROGRAM FROM PARTICIPANTS

5.20. How is the per capita financing regarded by personnel in participating schools? Do they feel it has been beneficial? Generally, yes. 85% of principals say that the per capita financing system is better than the former system. Most teachers also regard it positively.

5.21. Asked why the reform is an improvement, the most common reasons given by principals of per capita schools relate directly to autonomy: “we spend money on the needs of the schools”; “we can allocate funds independently”; “spending by our own discretion”; and so on. The next most common answer is the absence of delays in the payment of salaries under the new system. A few answers relate to knowledge, e.g., “schools know how much is in their account,” and “the schools knows how much it will receive and what to spend it on.”

5.22. As we will show, one of the main effects of the reform has been to induce class consolidation, leading to a reduction in teaching hours and therefore, in some cases, teachers’ salaries. We might therefore expect teachers’ attitudes to the reform to be negative. This turns out not to be the case. Even among teachers who reported that both their hours and salaries were reduced as a result of class consolidations, 71% (26 out of 36) said they regarded the program “positively,” while only 14% regarded it “negatively.”

5.23. One reason for the positive reaction of teachers to the program may be that it occurred simultaneously with a substantial pay raise for teachers throughout the country, as a result of which some teachers enjoyed higher salaries in spite of having their hours reduced. Alternatively, the reform may have induced improvements in the learning environment which have raised teachers' morale.

CONSOLIDATION OF CLASSES

5.24. During field visits, the PETS team was told by rayon officials and school principals that one way per capita financing affected school operations was to induce consolidation of classes. By consolidating classes, schools could reduce the total number of teaching hours, and therefore the amount of salaries paid out to teachers. Under the old system, it would not be advantageous for schools to do this, because any money saved would revert to the local budget, but once they got to keep the savings, they started consolidating. Is this story supported in the data?

5.25. We do not have data on class sizes in the affected schools before the reform. We do, however, have rich data on class sizes in the sample schools, which include both participants and non-participants in the per capita financing reform. Using schools would give us only 200 data points, but by using *classes* as observations, we can expand the sample size to over 8,000. This large sample allows for effective tests of the class consolidation hypothesis.

5.26. The results of a few regressions are shown in Table 39. In every regression, the per capita financing coefficient is positive and significant at the 1% level. This constitutes statistical evidence that schools are responding to the per capita financing program by consolidating classes. The size of the coefficient changes when other controls are included, falling lowest at just under 1. A coefficient of 1 means that the per capita financing schools are increasing class sizes, on average, by one pupil. While that may seem like a small change, the amounts spent on salaries are so much larger than the amounts spent on other school inputs that the savings may make a substantial difference.

Table 39: Evidence of class consolidation in per capita schools

	(1)	(2)	(3)	(4)	(5)
	Class size	Class size	Class size	Class size	Class size
Per capita financing program	2.067 (6.80)**	0.938 (3.58)**	1.462 (5.30)**	1.291 (5.83)**	0.826 (4.11)**
Urban (dummy)		5.573 (25.85)**	4.433 (19.49)**	3.704 (19.34)**	0.782 (4.41)**
Dushanbe (dummy)			3.814 (15.60)**	4.436 (17.92)**	0.230 (1.00)
Full secondary school, grades 1-11 (dummy)				5.474 (12.37)**	2.822 (7.31)**
Total pupils in school					0.006 (33.47)**
Constant	20.674 (40.78)**	19.532 (42.05)**	19.493 (42.14)**	15.483 (30.88)**	14.065 (31.24)**
Observations	8045	8045	8045	8045	8045
R-squared	0.02	0.16	0.18	0.29	0.43

Robust t-statistics in parentheses
* significant at 5%; ** significant at 1%
Dummies for each grade are included in all regressions but not shown.

BUDGET COMPOSITION IN PER CAPITA FINANCING SCHOOLS

5.27. Schools that participate in the PCF program can provide more disaggregated data on budget approval and execution. For non-PCF schools, data about general school budgets is available only at the rayon level. For PCF schools, budget data are available from schools. This change allows us to compare how PCF schools allocate their budgets with the way general schools budgets in non-PCF rayons are allocated. The comparison does not exactly match like with like: summary statistics calculated across school data may, for various reasons, differ slightly from summary statistics across rayon data. This statistical problem cannot be helped since non-PCF school-level budget data is not available, but it should be borne in mind. The results of the comparison are shown in Table 40.

5.28. The first thing to note is that the composition of PCF and non-PCF budgets is similar. No budget category differs by more than a few percentage points between PCF and non-PCF schools. Either PCF schools have not deemed it advantageous to make dramatic changes in budget composition compared to the old system, or else they have not had time to do so.

5.29. The second thing to note is that the largest categories, salaries and social insurance, have not been reduced as a share of the budget. This result is surprising in view of some findings reported in the next section. PCF schools consolidate classes, yet somehow this has not led to a reduction in the wage bill as a share of the total budget. Indeed, it appears to have increased it. The main source of savings in PCF schools appears to be utilities, especially heating and trash pickup.

Table 40: Composition, revision, and execution of budgets in per capita financing schools

Budget line	Share of approved budget		Share of executed budget		Median revision (as % of approved budget)		Median execution gap (as % of revised budget)	
	PCF*	Non-PCF**	PCF	Non-PCF	PCF	Non-PCF	PCF	Non-PCF
Wages and salaries	73.87	72.14	74.38	71.79	0.00	0.00	-2.36	-0.76
Social and retirement insurance	16.95	16.62	16.84	16.43	0.00	0.00	-2.79	-0.85
Purchase of goods and services	2.77	2.30	2.91	2.77	0.00	0.55	-2.33	-0.38
o/w: Stationery and handouts	0.80	0.44	0.78	0.45	0.00	0.00	0.00	-0.17
Economic expenditures and inventory	1.30	0.81	1.58	1.00	0.00	0.00	0.00	0.00
Travel expenses	0.22	0.10	0.16	0.12	0.00	0.00	-16.67	-0.13
Soft inventory and uniforms	0.12	0.10	0.13	0.09	0.00	0.00	0.00	-0.04
Food	0.05	0.30	0.05	0.35	0.00	0.00	-50.00	-0.02
Fuel and lubricants	0.01	0.03	0.01	0.04	0.00	0.00	0.00	-1.36
Goods and services not elsewhere classified	0.03	0.36	0.04	0.51	0.00	0.00	-0.34	0.00
Utilities	2.59	4.00	1.79	3.01	0.00	0.00	-3.16	-4.26
o/w: Electricity	1.16	1.36	0.67	0.76	0.00	0.00	0.00	-9.30
Heating	0.50	1.61	0.33	1.45	0.00	0.00	0.00	-0.06
Water	0.52	0.10	0.44	0.06	0.00	0.00	-1.73	-13.57
Trash pickup	0.15	0.52	0.12	0.32	0.00	0.00	-0.29	-1.13
Utility services not elsewhere classified	0.22	0.32	0.20	0.27	0.00	0.00	-0.26	-0.44
Maintenance and repair services	2.83	1.53	3.29	3.34	0.00	10.58	0.00	-0.00
o/w: Repair of buildings and structures	2.78	1.51	3.24	3.24	0.00	8.93	0.00	0.00
Fixed assets	0.81	0.38	0.62	0.74	0.00	0.00	-18.77	-0.28
o/w: Equipment, machinery and inventory	0.54	0.36	0.34	0.70	0.00	0.00	-18.77	-0.39

* Per capita financing school budgets

** Non-PCF general schools budgets from the rayon level

5.30. PCF schools spend a larger share of the budget on purchases of several types of goods and services. They spend almost twice as much on stationery, half again as much on economic expenditures and inventory, and more than twice as much on travel expenses (possibly because, with greater responsibilities for procurement and money management, principals and *zavkhozy* have more need to travel). They spend much less on food, fuel, and unclassified goods and services.

5.31. PCF schools also budget more for maintenance and repairs initially, but later revisions bring non-PCF schools even with the PCF schools at the execution stage. PCF schools also spend twice as much on fixed assets.

5.32. The PCF program is not the only reason that budget composition might be different in the rayons where it is operating. Although PCF rayons are scattered around the country, there may have been pre-existing differences in spending patterns and/or needs that partly account for the differences observed, particularly since the differences are small.

BETTER DELIVERY OF GOODS AND SERVICES

5.33. To quantify and compare the goods and services received by schools participating and not participating in the per capita financing program was difficult. Questions that could be asked in per capita financing schools would not make sense in non-per capita schools, and vice versa, because of the differences in the way goods are supplied.

5.34. One pair of comparable questions is the following:

Principals of per capita financing schools were asked whether they had an executed budget for various budget lines.

Principals of non-per capita financing schools were asked, “Did your school receive [*budget line description*] in 2006?” A comparison of the answers to these questions is shown in Table 41. The share of principals answering yes to each of these questions is shown in the cells of Table 41, for each of a list of budget lines.

Table 41: Per capita schools' advantage in supply of goods and services

Budget line	Non-PCF schools: Share that received goods	PCF schools: Share that executed a budget
2.4 Communication services	30.46%	51.02%
2.1.2 Economic expenditures and inventory	58.94%	83.67%
2.2.1 Electricity	90.07%	87.76%
2.2.3 Heating	66.89%	46.94%
2.3.1 Maintenance and repair of buildings	48.34%	91.84%
2.1.4 Soft inventory and uniforms / Sport goods	14.57%	30.61%
2.1.1 Stationery	60.93%	85.71%
2.2.5 Trash pickup	25.17%	42.86%
2.2.4 Water	37.09%	40.82%

5.35. Table 41 shows that, for all categories except electricity and heating, a larger share of per capita financing schools than of non-per capita financing schools is supplied with the good or service. Table 41 only reports *whether* the good or service in question was received, not *how much*. Of course, it would be useful to know, for example, whether the amounts of goods and services that per capita financing schools purchase are more adequate than the amounts that non-participating schools receive. But without budget records for non-participating schools, this comparison could not be made. Still, Table 41 is evidence that per capita financing schools are better supplied in most respects.

5.36. Why are heating and electricity different? Two possibilities may be suggested: In the case of electricity, supply may be affected by factors outside the schools' control. Power supply is erratic in many parts of Tajikistan, and may be rationed in ways that do not fit with the school's schedule. This is less likely to apply to heating.

5.37. Utilities, along with salaries and social benefits, are “protected lines” in Tajikistan’s regular budget process. They are protected, that is, from the cuts and reallocations that often occurred as budgets are passed up to the center and back down to rayons, jamoats, and schools. As a result, they may be relatively oversupplied. Without per capita financing and autonomy, schools may be left with more acute needs in “non-protected” areas than “protected” areas. If so, when they get autonomy, they may economize on utilities in order to get more stationery, supplies, and maintenance.

5.38. Interestingly, as shown in Table 42, despite spending less on heating, PCF schools do not seem to get less heating fuel. When principals were asked to estimate the amounts of coal and firewood needed to keep the school temperature comfortable during the winter, and then how much they actually got, the share of reported needs satisfied was slightly *higher* for PCF schools. The difference was not significantly different, but this evidence does not suggest, at any rate, that PCF schools are *less* well-heated, despite their smaller budgets.

Table 42: Despite lower heating budgets, PCF schools do not get less fuel

	Reported share of coal needs supplied	Reported share of wood needs supplied
Non-PCF schools	41%	36%
PCF schools	44%	43%

REDUCTION IN PROBLEMS WITH FACILITIES AND SUPPLIES

5.39. Interesting evidence about the effects of the financial programs comes from a series of questions, asked in both per capita financing and non-participating schools, about the importance of various problems as obstacles to educational performance. The answers differ between per capita financing and non-participating schools, sometimes with statistical significance. Results are shown in Table 43.

Table 43: Per capita schools report fewer problems with facilities, infrastructure, and supplies

Problem	Share of principals reporting that problem is “very important”	
	Non-PCF schools	PCF schools
Lack of teachers	54.8%	49.9%
Professional skills of teachers	48.6%	57.8%
Poor infrastructure / Facilities	49.1%	33.1%*
Inadequate supplies	69.2%	29.7%**
Heating	51.2%	30.9%

* Difference is significant at the 10% level in a regression with controls
 ** Difference is significant at the 5% level in a regression with controls

5.40. The major results in Table 43 are that principals of per capita financing schools are much less likely to complain of poor infrastructure and facilities, or of inadequate supplies. This is consistent with the result shown in Table 41 that more per capita financing schools get a variety of supplies, and execute a maintenance budget.

This is further evidence that schools use savings made by consolidating classes to serve more acute needs in supplies and maintenance.

5.41. Contrary to the result in Table 41, but consistent with the result in Table 42, Table 43 shows that principals of per capita financing schools are less likely to complain about heating. It is not clear why schools participating in the reform should have fewer problems with heating when fewer of them are executing budgets for heating, than those of the non-participating schools are receiving heating supplies. Since the result lacks statistical significance it may be an anomaly. It is also curious that per capita financing schools report *worse* problems with professional skills of teachers. One interpretation is that since they have been able to solve some of their other problems, they are able to focus more on the teacher quality issue. Again, without statistical significance any conclusions remain tentative.

CONCEPTUAL FRAMEWORKS

5.42. While stakeholders in the PCF reform are presumably most interested in this evidence generally of success, in view of the risk that success reflects short-run or unrelated factors, it may be helpful to suggest two theoretical rationales or conceptual frameworks by which the apparent success of the PCF reform may be understood. For this purpose, we draw on the concept of *accountability* as developed in the 2004 *World Development Report*, as well as the concept of an “education production function” drawn from the literature on the economics of education.

(a) The “short route” of accountability

5.43. One of the advantages of the per capita financing program is that it makes the budget process more transparent to the public. Under the traditional system, neither schools nor jamoats, and certainly not parents, had ready information on how much was spent on any individual school. Under the per capita financing system, each school receives a lump sum budget, and this amount can easily be made public. Budgets can be shown to parents, and parents can say how they think it should be spent. (For example, in one school visited by the PETS team during the design phase, the budget was posted on the outer wall of the school where everyone could see it.)

5.44. We asked principals whether the public participates in discussions about budget allocation. 62.5% of principals reported that they did. This participation occurs through parent committees and school committees.

5.45. The 2004 World Development Report developed the idea of “accountability” into a conceptual framework for the delivery of public services. It described a “long route of accountability” which runs from client-citizens to national governments to provider organizations to frontline providers. There was also a “short route of accountability” that runs directly from clients to frontline providers. Because there are so many difficulties in making the “long route” work effectively, it is often desirable to strengthen the “short route,” giving parents more influence over the way schools are run. Parents are likely to have their children’s best interests at heart, and are

in the best position to monitor schools, but since they don't pay and can't hire and fire school personnel, it may be difficult to get them involved in the process. Per capita financing seems to be a way to strengthen the "short route."

(b) Per Capita Financing and "Education Production Functions"

5.46. Economists of education sometimes use the concept of an education "production function" to clarify what it means for a school to run efficiently. A production function identifies "outputs" of some process—in education, chiefly student learning, and perhaps moral development, socialization and other educational goals—and "inputs" to the process—in education, buildings, teachers, textbooks, and so forth—and relates the "outputs" to the "inputs." If funds are limited, there is also a "budget constraint," and the economic problem is to choose the combination of inputs that will maximize outputs—the combination of teachers, desks, chalk, etc. that will maximize learning—subject to the budget constraint. Given some combination of inputs, each input will have a "marginal" output—how much average test scores in a school will rise if another hundred textbooks are provided, for example—which represents the improvement if that input alone is changed. At an efficient allocation, the "marginal product" of all inputs should be equal; otherwise output could be increased, without increasing costs, by substituting an input with a high marginal product for an input with low marginal product.

5.47. Per capita financing schools appear to have substituted away from some inputs—mainly teachers, maybe utilities—in favor of others—supplies and maintenance. This pattern is consistent with the hypothesis that the marginal educational product of different inputs was unequal under the old system, and per capita financing schools substituted in favor of the inputs with the highest marginal product. We can make no attempt to check this directly, in the absence of any indicators of school performance. And it cannot necessarily be presumed, because the objectives of school decision-makers are not necessarily identical with the interests of pupils. However, international research suggests that the allocative changes observed in per capita financing schools *are* what is needed to improve the efficiency of education spending. Two findings in the education literature are (a) that class size, within ordinary ranges, has little or no effect on learning, and (b) that the input mix in education is consistently biased in favor of teacher-related inputs. Class consolidation, and the use of savings for non-teacher-related inputs, is precisely the recommendation to emerge from the literature. Presumably, principals of per capita financing schools have not read this literature. Rather, they are familiar with their own schools' learning environments, and understand how to improve them. Parents may also be aware of school needs, and, if necessary, pressure principals to put the interests of pupils first.

PER CAPITA FINANCING – CONCLUSION

5.48. The per capita financing program is popular with participants and appears to induce a more efficient use of resources by schools. The PETS data enable us to identify changes in the way schools are allocating their budgets. In consolidating

classes to purchase more supplies and maintenance, the schools appear to be behaving in something like the way that education scholars would most likely recommend.

5.49. Per capita financing puts more discretion in the hands of school principals. It also improves transparency and encourages feedback from civil society. Principals, and maybe parents, seem to do a good job of using money efficiently. A good next step might be to develop indicators of school performance which would allow parents to see the performance of their child's school and compare it to other schools. School financial autonomy will also allow schools to try new approaches, with others observing and copying them if the innovations seem successful. Meanwhile, the evidence of success in the pilot rayons strengthens the case for extending the reform to the rest of the country.

6. ASSORTED VIEWS ON SCHOOL NEEDS

6.1. The judgment that non-wage school needs are especially acute, which was applied in the analysis in the first sections of this report, was based partly on international research and on observed behavior by PCF schools once they gained financial autonomy. It was also based on principals' and teachers' answers to direct questions. Each of a series of supply- and resource-related problems were listed as "necessary to improve the education process" by one-third to one-half of teachers, relative to only 12% who regarded "more teachers" as necessary. Among principals, "inadequate supplies" ranked as the problem most frequently reported as "very important." Interviews with principals and teachers and evidence from other studies also shed light, however, on problems that cannot be directly addressed by the education financing system, namely weak demand and student effort, likely related to low returns to education, and, on the other hand, perceptions of corruption and low quality by pupils' parents. Non-PETS evidence indicating perceptions of low quality and unofficial payments may also be relevant.

TEACHERS

6.2. Since teachers are closest to the learning process, we asked teachers "What is necessary to improve the education process?" The answers are shown in Table 44:

Table 44: Outstanding school needs, according to teachers

What is necessary to improve the education process?	Share of teachers reporting problem	Comments
Good heating in the school	34%	Problem more frequently mentioned in rural areas.
Good textbooks	50%	Teachers in schools that report textbook shortages are more likely to report this problem.
Hand out material	65%	Problem more frequently mentioned in rural areas.
Higher pay for teachers	79%	Rural teachers are more likely to mention this problem
School "inventory" (furniture)	44%	Problem less common in Dushanbe. Reported inventory shortages worse in PCF schools.
More textbooks	46%	
More teachers	12%	Problem less common in Dushanbe.
To raise the level of teachers' skills	37%	Problem less common in Dushanbe.
Repair of the facilities	31%	Repair problems are more common in rural areas. Fewer teachers report a need for repair in PCF schools.

6.3. In addition to the reasons listed in Table 19, 20 sample teachers reported that “control from the side of parents” was needed to improve the educational process. A further question asked teachers “What, in your opinion, is the obstacle to better learning outcomes in your classroom?” with responses including both problems related to financing and resources, and problems from the demand side. The answers to these questions are shown in Table 45. It is worth noting that only 25% of teachers reported “poor financing” as an obstacle to better learning outcomes, and all the resource-related issues together added up to only 38% of the responses.

Table 45: Obstacles to improving learning outcomes

What, in your opinion, is the obstacle to better learning outcomes in your classroom?	Share mentioning each answer
Living level of pupils	31%
Pupils' lack of interest to education	21%
Total demand-side	52%
Poor financing	25%
Lack of training materials	5%
Lack of classrooms	3%
Poor conditions of classroom	3%
Outdated training materials	2%
Total supply-side and resource-related	38%
<i>No control from the side of parents</i>	6%
<i>(VOLUNTEER; NOT ONE OF ORIGINAL ANSWER CHOICES)</i>	

PRINCIPALS

6.4. Teachers’ responses to questions about schools’ problems may be compared with similar questions put to school principals. Principals have a different perspective, and may be less subject to some of the self-interested bias that teachers probably feel with respect to their own pay and to new hiring. One result that emerges clearly from principals’ responses to questions about problems is a geographical difference, namely: Except the heating of classrooms, the proportion of principals that reported problems as being very important is larger among rural schools than among urban ones:

The problem of lack of teachers is perceived by a majority of principals from rural schools (57%) as being very important compared to urban schools. In urban schools, 41% of principals reported that this is not a very important problem.

A majority of principals from PCF schools (58%) judged that the professional skill of teachers is a very important problem compared to 47% for non-PCF schools. This problem is also perceived by a majority of teachers from rural schools as being very important;

With PCF financing, schools use resources allocated to them according to their needs. This might explain why a smaller proportion of principals reported the problems of inadequate supplies and lack of heating of classrooms as being very important. The

proportion of principals that reported the problem of inadequate supplies as being very important is 30% among PCF schools, but it is much lower compared to non-PCF schools (69%). The lack of heating of classrooms is also less acute among PCF schools: 31% of principals reported it compared to 52% among non-PCF schools. The responses to the infrastructure question will be revisited in the next section.

Table 46: Share of principals reporting selected problems as “very important,” “not important”

	Location		Type of financing		Total
	Urban	Rural	PCF	non-PCF	
Lack of teachers is:					
Very important	23.5%	58.6%	49.9%	54.8%	54.4%
Not important	40.8%	18.4%	22.3%	21.0%	21.1%
Professional skills of teachers					
Very important	35.4%	51.2%	57.8%	48.6%	49.3%
Not important	20.6%	14.6%	5.3%	16.1%	15.3%
Poor infrastructure (incl. roads, electricity, water, transport)					
Very important	34.2%	49.7%	33.1%	49.1%	47.9%
Not important	22.0%	9.5%	13.8%	10.7%	11.0%
Inadequate supplies of the school					
Very important	37.3%	70.1%	29.7%	69.2%	66.2%
Not important	13.9%	2.1%	15.2%	2.5%	3.5%
No heating of classrooms					
Very important	59.4%	48.4%	30.9%	51.2%	49.7%
Not important	13.2%	17.8%	5.6%	18.2%	17.2%

SUPPLY AND DEMAND

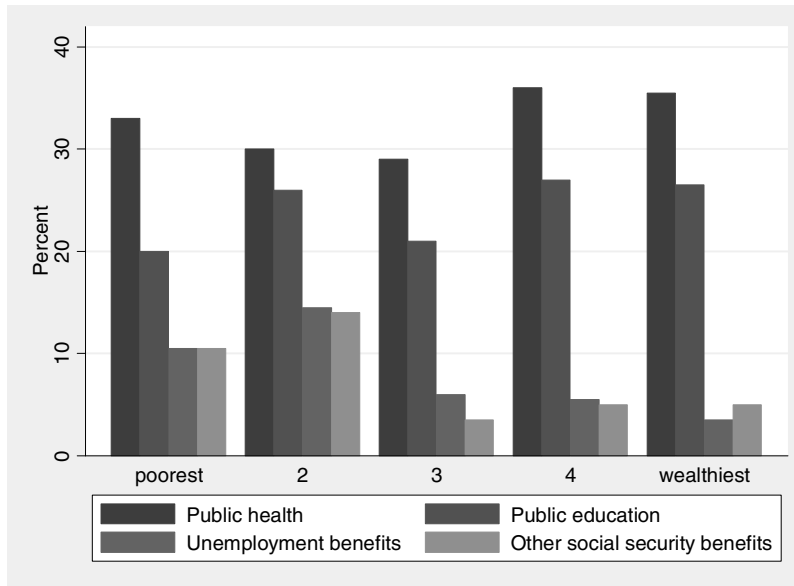
6.5. Although the responses of participants to questions about the problems faced by the education system generally confirm that poor resources are a serious problem, teachers’ responses in particular suggest another kind of problem. If teacher vacancies, poor facilities, or lack of heating are *supply-side* problems, low living standards of pupils and pupils’ lack of interest may be called *demand-side* problems. More teachers saw the demand side as an obstacle to success than the supply side.

6.6. It is understandable that pupils who lack adequate food, clothing, and shelter, or who have to work at home to help support the household, may have difficulty focusing on their studies. Furthermore, it is not clear that the structure of the Tajik economy yields high returns to education. For many Tajiks, the best economic opportunity is to go to Russia, and the kinds of labor demanded there of migrant workers is likely to demand little of the knowledge and skills that can be acquired in school. To the extent that the real problems lie on the demand side, there may be limits to what supply-side improvements in school resources can achieve.

CORRUPTION AND QUALITY PERCEPTIONS

6.7. PETS did not interview end-users of the school system, but some data is available from other research. Based on data from the Life in Transition Survey, EBRD (2007) notes that over 60 percent of surveyed individuals think there is more corruption in the country compared to 1989, and the education and health sectors are particularly affected by the prevalence of unofficial payments. The poor and the wealthy alike bear the burden of unofficial payments in order to receive public services (Figure 12).

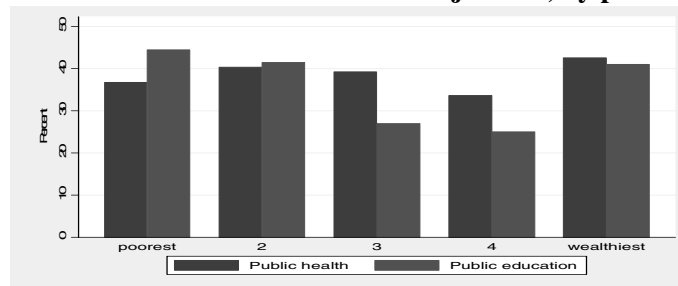
Figure 12: Unofficial payments for public services in Tajikistan, by poverty status



Source: 2008 Poverty Assessment based on Life in Transition Survey (2006)

6.8. At the same time that the graph above reports high rates of unofficial payments in public education, the graph below (Figure 13) shows the high rates of dissatisfaction with the quality and efficiency of public education services in the country. In other words, despite having to pay extra to receive services, the population still considers the services received to be sub-standard.

Figure 13: Dissatisfaction (very unsatisfied or unsatisfied) with quality and efficiency of public education and health services in Tajikistan, by poverty status



Source: 2008 Poverty Assessment based on Life in Transition Survey (2006).

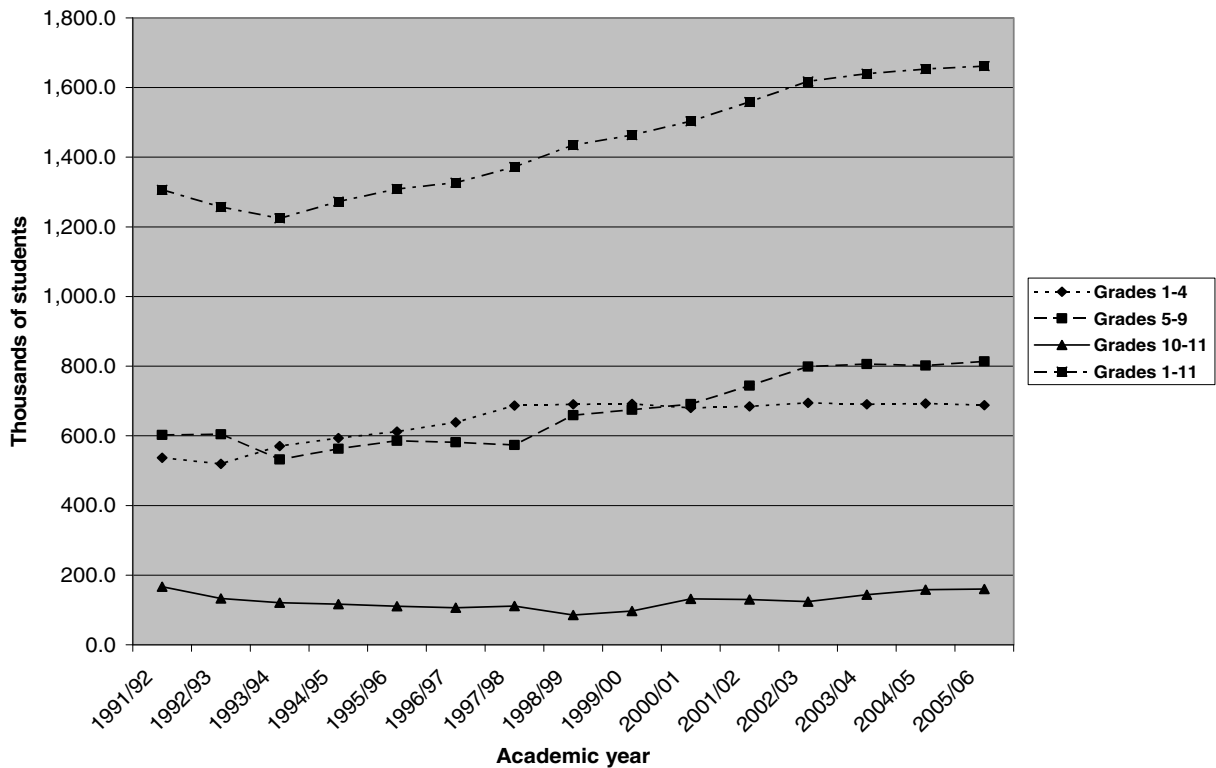
7. INVESTMENT

6.9. The population of pupils in Tajikistan is growing, and investment is needed to accommodate rising pupil populations. Unfortunately, the PETS is not a survey instrument well-suited to studying capital investment in education. The reason is that capital renovation is by nature “lumpy,” being rotated among schools, while the construction of new schools takes place at schools that do not yet exist and cannot be included in the sample. Still, evidence from the PETS data suggests that schools have investment needs which are not being met. Indeed, the capacity of facilities is already under strain. If anything, the problem appears to be getting worse, despite a recent increase in spending on capital investment in education.

INVESTMENT SPENDING RESPONDS TO RISING ENROLMENTS

6.10. Enrolments in general education have trended upward for grades 1-4 and grades 5-9 following a dip in the early nineties (see Figure 14). For grades 10-11, on the other hand, the dip in enrolments in the early 90s was more sustained lasting into the late 90s, and although enrolments have increased again since 2000, they are still today only roughly at what they were in 1991. Gross enrolment rates for upper secondary education have experienced a sharp decline since the transition, although they may be showing an upward trend since 2002. Tajikistan’s 2005 gross enrolment rate (GER) is at 31 percent, compared to a GER of 41 and 43 percent in Kazakhstan and Kyrgyzstan, respectively. Thus, despite the increases in enrolment in general education, further improvement in enrolment rates is required, implying further increases in student body size given the population projections.

Figure 14: Enrolment trends in general education, 1991-2006

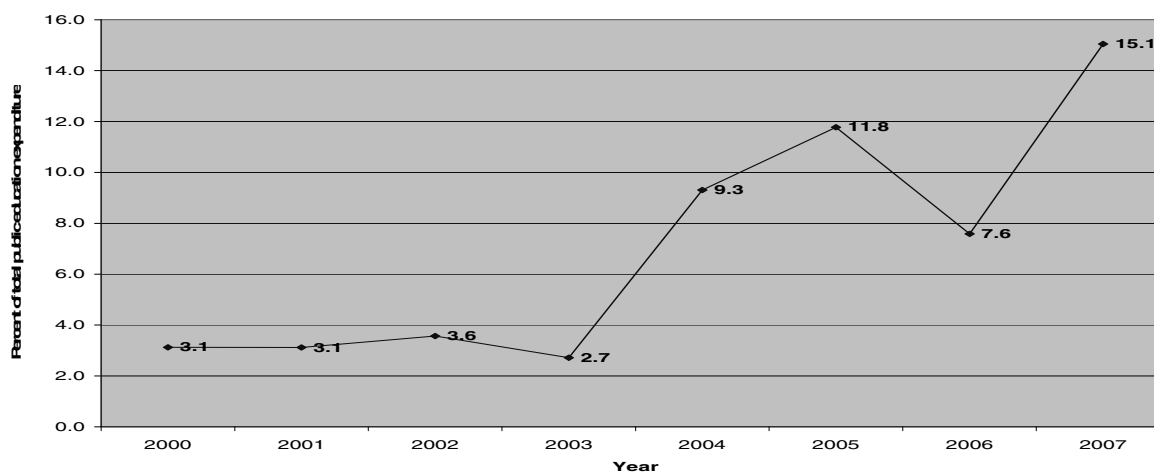


Source: National Statistics Committee 2006.

6.11. To accommodate a large pupil population, more investment in facilities is needed. Accordingly, as Figure 15 shows, beginning in 2004, capital expenditures have constituted an increasing share of total education expenditures. Starting at the very low share of roughly 3 percent of total education expenditures, capital expenditures in 2007 amounted to a high of 15 percent. Clearly, therefore, the Government has not only shown a commitment to the education sector as a whole over the last few years but specifically to its infrastructure and investment needs. In addition, it must be noted that international donors are quite active in the area of school rehabilitation and construction.

6.12. The PETS collected information about the construction of additional classrooms and other premises during the last five years. Information about schools was collected from directors or deputy directors. They are in majority male, have a higher education level and worked on average 10 years as director of the current school. In this section, we analyze the characteristics of the schools in term of teaching staff, the school infrastructure and the perception of problems that affect schools performance.

Figure 15: Capital expenditure as a share of total public expenditure, 2000-2007



Source: Ministry of Finance.

PETS UPDATES EDUCATION SECTOR REVIEW

6.13. The Education sector Review (World Bank, 2002) pointed out three factors in the deterioration of the physical infrastructure in the education sector: deferred maintenance, damage and destruction during the civil war, and intensive use. The PETS findings are:

- **Nearly half of schools principals (49%) reported that their school experienced overfull classes.** The incidence varies across oblasts. One of the options available to principals is to split classes in order to reduce their size. However, they reported that lack of teachers and lack of classrooms prevented them to do so: 85% of principals that reported experiencing overfull classes said that the lack of classrooms is an obstacle to class splitting and 54% reported that lack of teachers is an obstacle.
- **Capital renovations were rare.** Only 14% of school principals reported that a capital renovation was undertaken during the previous five years. Nearly three out of four principals (72%) reported that there wasn't any capital renovation in the school since it had been built. Capital renovations are more likely to be undertaken in urban than in rural areas: 40% of principals from urban areas reported that a capital renovation was undertaken. The proportion is 24% for rural schools.

6.14. Has the situation improved? If anything, the PETS evidence suggests that the infrastructure problems have gotten worse. At national level, 18% of principals reported that a classroom or a premise has been added to the school during the last five years. The proportion is slightly higher in rural (19%) than in urban areas (15%).

6.15. The lack of repair, maintenance and addition of buildings combined with a growing school aged population caused schools to operate in two or three shifts.

Estimates from the PETS show that 96% of schools operate in two or three shifts resulting in an intensive use of school premises.

EFS AND PETS PANEL DATA: REPORTED FACILITIES PROBLEMS GETTING WORSE

6.16. The PETS sample was designed to oversample schools which were visited three years previously as part of an Education Facilities Survey conducted in 2004, and some questions were deliberately included in both surveys. As a result, a small panel can be constructed of schools that were included in the sample of both surveys, and the evolution of principals’ answers to certain questions can be established. Although only limited analysis of this panel data was performed during the current phase, one important result nonetheless emerges: **problems with poor facilities worsened substantially relative to other problems between 2004 and 2007.**

6.17. Principals were asked about five specific problems: **lack of teachers, professional skills of teachers, poor infrastructure, inadequate supplies, and no heating of classrooms.** They reported how important—very important, quite important, somewhat important or not important—these problems are for their school. The same question was included in the Education Facilities Survey of 2004, and table 21 reports for both surveys the proportion of principals that judged the problems as being very important. Since the answers are subjective, the *absolute* value of the percentages has no definite interpretation. **But the change in principals’ answers to the same questions between 2004 and 2007 does provide meaningful evidence about trends in the acuteness of school needs.** The results are shown in Table 47.

Table 47: Proportion of principals that reported problems as being very important

Problem:	2004 (EFS)	2007 (PETS)
Shortage of teachers	56.0%	54.4%
Quality/skills of teachers	38.4%	49.3%
Poor infrastructure	25.5%	47.9%
Inadequate supplies	50.6%	66.2%
No heating of classrooms	63.3%	49.7%

Source: Education Facilities Survey (2004) and PETS (2007)

6.18. Of the five problems, only one—heating of schools—seems clearly to have become less serious between 2004 and 2007. It is not clear to what extent the weather (i.e., a harsh winter in 2004-05 and/or a mild winter in 2006-07) might account for this change in opinion (which may have reversed itself during the harsh winter of 2007-08). There was also a marginal improvement in the share of principals complaining of a “shortage of teachers.” This change may reflect the pay raise and the return of teachers it has induced, discussed above. Though the improvement is small, it stands out against the deterioration seen in the other indicators. The other three problems—quality/skills of teachers, poor facilities, and inadequate supplies—all seem to have gotten worse. But the most severe deterioration is seen with respect to problems of poor infrastructure, which

were regarded as “very important” by only 26% of principals in 2004, but 48% in 2007. This result underlines the need for investment in school facilities to accommodate the growing pupil population, and the inadequacy of such investment to date.

CONCLUSION: WHERE IS INVESTMENT SPENDING GOING?

6.19. The results of this cursory examination of the evidence are tentative but **troubling**. In view of the official increase in investment spending, it might be hoped that more principals would report repairs and new construction of classrooms, but this is not observed, possibly because most new investment is going to new schools (see Section II), or possibly because budgeted investment expenditures are not being well used. Further examination is needed to clarify whether investment expenditures are effectively meeting schools’ needs.

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ANNEXES - TABLES

**Summary statistics on the average number of teaching hours per week
(Teacher's data)**

	Mean	Standard Error	Min	Max
Dushanbe	28	0.8	11	41
RRP	25	0.8	3	48
Sogd	21	0.6	10	52
Khatlon	28	0.6	4	52
Gbao	18	1.3	8	29
Urban	25	0.5	6	51
Rural	24	0.5	3	52
PCF	25	0.7	8	48
non-PCF	24	0.4	3	52
Total	24	0.4	3	52

Average number of staff per category

	Teachers		Administrative, teaching auxiliary		Technical staff	
	Mean	Std. error	Mean	Std. error	Mean	Std. error
Dushanbe	63	7.0	11	0.9	13	1.1
RRP	29	3.2	6	0.6	10	1.0
Sogd	34	5.6	7	0.5	10	1.3
Khatlon	22	4.8	5	0.9	9	1.8
Gbao	27	7.7	5	1.2	7	2.5
Urban	58	3.6	9	0.6	15	0.8
Rural	24	2.9	5	0.5	9	0.9
PCF	39	6.0	8	0.9	11	1.5
non-PCF	28	3.2	5	0.5	9	0.9
Total	29	3.0	6	0.5	10	0.9

Average number of pupils

	# of pupils
Dushanbe	1656 (186.6)
RRP	511 (72.6)
Sogd	421 (83.2)
Khatlon	450 (106.1)
Gbao	259 (55.3)
Urban	1161 (81.3)
Rural	383 (50.6)
PCF	705 (113.5)
no PCF	457 (58.6)
Total	476 (56.8)

Average number of teaching hours per week for administrative staff

Oblast	Mean	Std. Error
Dushanbe	12.1	1.4
RRP	14.1	1.1
Sogd	11.9	0.8
Khatlon	16.2	0.9
Gbao	9.6	3.5
Urban	11.1	0.5
Rural	14.4	0.7
PCF	10.2	1.0
non-PCF	14.3	0.7
Total	14.0	0.7

Average number of pupils per administrative/technical staff

	Number of pupils per			
	Administrative staff		Technical staff	
Dushanbe	158.4	(15.0)	138.3	(14.6)
RRP	89.1	(12.1)	48.6	(4.0)
Sogd	58.8	(10.2)	35.8	(4.9)
Khatlon	90.6	(17.5)	42.9	(8.0)
Gbao	49.3	(1.3)	50.1	(12.9)
Urban	142.2	(8.7)	91.6	(9.1)
Rural	71.9	(8.1)	38.4	(3.7)
PCF	89.5	(10.8)	73.4	(14.2)
non-PCF	79.5	(8.7)	42.4	(4.1)
Total	80.2	(8.1)	44.8	(4.2)

Cluster analysis:

Composition of clusters by oblast and location

	Dushanbe	RRP	Sogd	Khatlon	Gbao	Total
	<i>Urban</i>					
1	1	4	2	10	1	18
2	21	5	9	8	1	44
3	0	0	12	2	0	14
Total	22	9	23	20	2	76
	<i>Rural</i>					
1		12	12	30	1	55
2		20	3	18	2	43
3		3	15	7	1	26
Total		35	30	55	4	124

Characterization of cluster by rayons

CLUSTER	Oblast	Rayon	number of schools from the rayon that are in the cluster
Cluster 1	RRP	Rudaki	2 out of 7 schools
		Gissar	2 out of 5 schools
		Rasht	2 out of 2 schools
		Vahdat	4 out of 14 schools
	Sogd	B Gafurov	3 out of 6 schools
		Istravsha	4 out of 5 schools
		Pentjeken	4 out of 6 schools
	Khatlon	A Jomi	3 out of 3 schools
		Bohtar	2 out of 4 schools
		Jilikul	2 out of 2 schools
		Kabodijan	3 out of 3 schools
		Kolhozaba	4 out of 4 schools
		Kumsangir	2 out of 2 schools
Kurgan-Tu		4 out of 4 schools	
Panj		2 out of 2 schools	
Shahritus		2 out of 2 schools	
Vahsh		3 out of 3 schools	
Vos'e		3 out of 4 schools	
Cluster 2		Dushanbe	A Sino
	Firdavsi		6 out of 6 schools
	I Somoni		4 out of 4 schools
	Shohmansu		4 out of 4 schools
	RRP	Varzob	2 out of 2 schools
		Rudaki	3 out of 7 schools
		Gissar	2 out of 5 schools
		Tursunzad	5 out of 6 schools
		Vahdat	10 out of 14 schools
	Sogd	Isfarinsk	3 out of 4 schools
		Khujand	8 out of 12 schools
	Khatlon	Yavan	8 out of 10 schools
		Dangara	3 out of 4 schools
Kuljabsky		10 out of 11 schools	
Cluster 3	RRP	Rudaki	2 out of 7 schools
	Sogd	Asht	3 out of 3 schools
		B Gafurov	2 out of 6 schools
		Ganchinsk	2 out of 3 schools
		J Rasulov	2 out of 2 schools
		Khujand	4 out of 12 schools
		Konibodom	3 out of 4 schools
		Matcho	2 out of 2 schools
		Spitamen	2 out of 2 schools
	Pentjeken	2 out of 6 schools	
Khatlon	Bohtar	2 out of 4 schools	
	Hamadoni	2 out of 3 schools	

APPENDIX I. ACCURACY OF RAYON ALLOCATIONS

Columns (1) and (2) define an “x” and “y” which should, if all procedures are correctly followed¹³, be equal to each other. For example, the economic and functional breakdowns of the education budget should sum to the total education budget. Since figures are reported for three stages of the budget process, with an initial approved budget undergoing revisions in the course of the year, and an executed budget reported afterwards, column (3) reports the stage of the budget process. Column (4) shows the share of rayons where the quantities observed are indeed equal, while column (5) reports the average discrepancy in the cases where they were not. Category (6) reports the share of the total education budget comprised by the quantity in “x.”

(1)	(2)	(3)	(4)	(5)	(6)
<i>x</i>	<i>y</i>	Stage of budget process	Share (%) of PETS rayons where $x = y$	Average discrepancy where $x \neq y$	Category's avg. share of 2006 education budget
Total education budget for 2006	Functional breakdown: Preschool + secondary + higher/vocational + spending not classified by level + “other educational activity”	Approved	95%	3.8%	100%
		Revised	93%	3.2%	100%
		Executed	95%	0.0%	100%
“Other educational activities,” approved	Educational management and supervision + auxiliary educational activity + educational activity not elsewhere classified	Approved	97%	1.4%	3%
		Revised	97%	1.6%	3%
		Executed	97%	0.9%	3%
Total education budget for 2006	Economic breakdown: Wages and salaries + social and retirement insurance + purchase of goods and services + utilities + maintenance and repair + communications + transfers for population + centralized capital investments + purchases of equipment, machinery, and inventory	Approved	100%	-	100%
		Revised	98%	0.0%	100%
		Executed	98%	0.0%	100%
General schools budget for 2006	Economic breakdown of general schools budget: Wages and salaries + social and retirement insurance + purchases of goods and services + utilities + maintenance and repair + communications + transfers for population + central capital investments + purchase of equipment, machinery and inventory	Approved	100%	-	87%
		Revised	100%	-	87%
		Executed	100%	-	87%
Total education budget for 2006	All jamoat budgets + RED budget + other educational institutions and institutions funded directly through RFD	Approved	44%	7.8%	10%
		Revised	26%	11.8%	100%
		Executed	33%	7.4%	100%

¹³ And if the PETS team has understood the budget process correctly.

APPENDIX II. CLUSTERING SCHOOLS

The PETS has identified some major constraints that are hindering the resources flows in the education system. However, some important questions for policy design remain unanswered: how do these problems relate together? Are they affecting similarly all the regions? Is there a need for a location specific policy response? The objective of this section is to identify association between problems faced by schools and whether there is any geographical pattern. In identifying such pattern, we provide a basis for targeted policy responses.

SELECTED VARIABLES

In the analysis, we use a non-parametric method to classify schools based on six variables capturing to which extend the school suffers from shortage of inputs, public resources and surrounding infrastructure. In what follow, we first discuss these variables and then present the result of our multivariate analysis.¹⁴

Lack of teachers: According to principals, this problem prevails in 81% of schools.

Overfull classes: 49% of principals declared that their school experiences overfull classes. Since principals are allowed to split classes when size exceeds a given rule, overfull classes might be indicative of two situations: lack of teachers or classrooms. Almost all the schools are already functioning in two shifts and it is possible that there is little room for creating additional classes.

Textbooks: 16% of school principals reported that there are enough textbooks in their school.

Delays in salary payment: teachers that experience delays in salary payment are likely to be less motivated and more likely to practice moonlighting than teachers that receive their salary on time. In the PETS, the direct information on delays of salary payment is not available for PCF schools. Hence, we use the information available from teachers' data to generate a measure of delays. Teachers were asked if there have been occasions in 2006 where their salary was delayed. We aggregate this information at school level into a dummy variable capturing whether at least one teacher has experienced delays in salary payment or not.

Principals were asked to give their judgment on the relevance of five problems for their school. They were asked to say if these problems are very important, important or not important at all for their school. These problems are: lack of teachers, professional skills of teachers, poor infrastructure, inadequate supplies and lack of heating of the classrooms. For this analysis, we selected two of them and recode them into dummies

¹⁴ The command does not allow the use of survey weights.

capturing whether the school principal reported the problem as being very important or not:

Inadequate supplies: 66% of school principals reported that an inadequate supply to their school is a very important problem.

No heating of classrooms: 50% of schools principals reported that this is a very important problem.

CHARACTERIZATION OF THE GROUPS

We partition the sample of schools into three clusters based on their similarity with respect to these variables. The objective is to have groups that are different from each other but homogenous. We first describe the three groups of schools. The three clusters differ in size. There are respectively 73, 87 and 40 schools in cluster 1, 2 and 3.

Table 50. Characterization of clusters by oblast/location

Cluster:	Characterization
1	Rural schools: 55 out of 73 schools in the cluster 44% of rural schools Rural schools from Khatlon (30 out of 55 urban schools)
2	Urban schools: 44 out of 76 urban schools) Dushanbe (21 out of 22 schools from Dushanbe) Rural RRP and Khatlon (38 out of 43 rural schools in the cluster)
3	Sogd (27 out of 40 schools of the cluster)

In Table 50, we characterize clusters in term of variables used to determine them. We report for each cluster and each variable the proportion of schools within the cluster that are affected by the problem.

The first cluster is composed of rural schools and some urban schools from Khatlon. It is characterized by a high incidence of problems compared to the average. The lack of teachers is reported by 81% of principals. Overfull classes is also reported by 73% of principals. In addition, all the school principals reported that inadequate supplies and the absence of heating of classrooms are very important.

The second cluster is more diverse. Even though nearly all the schools from Dushanbe belong to this cluster, it includes a great deal of rural schools from RRP or Khatlon. **In this cluster, there is no salary delay and few principals judged that inadequate supplies or lack of heating are very important problems.** Lack of teachers and overfull classes are widespread and the incidence of these problems in the second cluster is similar to the incidence in the sample. The proportion of school principals that reported having a sufficient number of textbooks is also higher than the average.

The third cluster is composed in majority of schools from Sogd. Salary delays are reported in all the schools in this cluster. Overfull classes are relatively less reported in this cluster compared to the others: only 40% of schools principals reported it (compared

to 73% in the first cluster and 64% in the second cluster). However, lack of teachers is reported by 80% of school principals.

Table 51. Results from the cluster analysis: proportion at cluster level

	Cluster 1	Cluster 2	Cluster 3	Total (*)
Do you experience lack of teachers?	80.8%	66.7%	80.0%	74.5%
Are there overfull classes?	72.6%	64.4%	40.0%	62.5%
Is there enough textbooks?	11.0%	14.9%	7.5%	12.0%
salary delays	53.4%	0.0%	100.0%	39.5%
Is the following a very important problem:				
Inadequate supplies	100.0%	10.3%	27.5%	46.5%
No heating of classrooms	100.0%	25.3%	40.0%	55.5%

(*) We do not use weights in this table and proportions here do not necessarily coincide with the ones reported in section A.

The analysis does not allow the association of oblast or group of schools to specific problems. Except delays in salary payments and the perception of the importance of inadequate supplies and heating, the others problems are widespread and the incidence is high in all the clusters.